

Table of measurements.

Collector's number of specimen .....	150	
Locality .....	Port Townsend, Wash.	
	Inches and 100ths.	100ths of length.
Extreme length .....	9.25	.....
Length to end of middle caudal rays .....	8.75	.....
Body:		
Greatest height .....		7 $\frac{3}{4}$
Height at ventrals .....		6
Least height of tail .....		2 $\frac{1}{2}$
Head:		
Greatest length .....		2 $\frac{1}{2}$
Width of interorbital area .....		2 $\frac{3}{4}$
Length of snout .....		11 $\frac{1}{2}$
Length of maxillary .....		9
Length of mandible .....		12 $\frac{1}{2}$
Diameter of orbit .....		3 $\frac{1}{2}$
Dorsal (rayed):		
Distance from snout .....		55 $\frac{1}{2}$
Length of base .....		2 $\frac{1}{2}$
Height at fourth ray .....		5
Dorsal (adipose):		
Distance from dorsal .....		29 $\frac{1}{2}$
Height at longest ray .....		2 $\frac{1}{2}$
Anal:		
Distance from ventral base .....		11 $\frac{1}{2}$
Length of base .....		15
Height at longest ray (ca.) .....		6
Caudal:		
Length of middle rays .....		2 $\frac{1}{2}$
Length of external rays .....		6
Pectoral:		
Distance from snout .....		24
Distance from dorsal outline .....		3 $\frac{1}{2}$
Length .....		5
Ventral:		
Distance from snout .....		50 $\frac{1}{2}$
Length .....		3 $\frac{3}{4}$
Branchiostegals .....	7	.....
Dorsal .....	8	.....
Anal .....	31	.....
Pectoral .....	11	.....
Ventral .....	9	.....
Number of scales in lateral line .....	60	.....

PORT TOWNSEND, WASH., September 30, 1880.

**PRELIMINARY NOTICE OF THE CRUSTACEA DREDGED, IN 64 TO 325 FATHOMS, OFF THE SOUTH COAST OF NEW ENGLAND, BY THE UNITED STATES FISH COMMISSION IN 1880.**

**By S. I. SMITH.**

A general account of three short dredging trips of the United States steamer Fish Hawk to the region, off the eastern end of Long Island, known as the Block Island soundings, has already been given by Professor Verrill in these Proceedings, and also in the American Journal of Science for the present month (vol. xx, pp. 390-403), and need not be repeated here, further than that the region examined is in latitude 39° 46' to 40° 06' north, longitude 70° 22' to 71° 10' west, and that on the first trip, September 3 to 5, eight hauls (stations 865 to 872) were made, at depths ranging from 64 to 192 fathoms; on the second trip, September 12 to 14, nine hauls (stations 873 to 881) were made, in 85 to 325 fathoms;

and on the third trip, October 1 to 3, five hauls (stations 891 to 895) were made, in 238 to about 500 fathoms. At station 872, 86 fathoms, the bottom was covered with shells and sponges, but at all the other stations it was composed of fine sand and mud, varying in proportions and in compactness. The collections from the last trip have not yet been fully examined, and only a few of the species are recorded in the following pages. There was, however, a much smaller number of crustaceans obtained upon this last trip than upon the others.

The wonderful richness of the fauna of the sea-bottom in this region, in mollusks and echinoderms, has been shown in Professor Verrill's papers just referred to, and it is not less remarkable as regards the crustaceans. The richness, in both species and individuals, of this crustacean fauna would never have been suspected, and scarcely dreamed of, by one accustomed only to the meager fauna of the shallower waters of the south coast of New England. The larger part of the species secured from the great masses of material brought up in the trawl and dredge are Decapoda. There are comparatively few small species of Schizopoda, Cumacea, and Amphipoda, and further dredging will undoubtedly increase very greatly the number of species in these groups. The following enumeration is not complete even for the Decapoda, and much less so for the other groups, as several of the species are represented by specimens insufficient for proper determination, while others are omitted because not yet satisfactorily determined.

The exact location, depth, character of bottom, and temperature for each of the stations are given by Professor Verrill in the papers above referred to, and in the following pages I give only the serial numbers of the stations at which the species occurred, and the range in depth from the shallowest to the deepest of these stations. In occasionally referring to localities of dredgings carried on by the Fish Commission in previous years, I give the serial numbers of the stations according to the "Lists of the Dredging Stations of the United States Fish Commission from 1871 to 1879, inclusive, with Temperature and other Observations, arranged by Sanderson Smith and Richard Rathbun", in the Commissioner's Report for 1879.

#### BRACHYURA.

##### *Hyas coarctatus* Leach.

Several specimens from 86 fathoms, station 872, and 115 fathoms, station 871.

*Collodes depressus* A. Milne-Edwards, Crust. Région Mexicaine, p. 176, pl. 32, fig. 4, 1872.

I refer to this species a considerable number of specimens from stations 865, 871, 872, 873, 874, 875, 878; 65 to 142 fathoms. Most of these specimens are much larger than those described by Milne-Edwards, and in all the larger, and in some of the smaller, specimens examined the three dorsal spines of the carapax and abdomen are almost wholly obsolete,

but in other respects they all agree well with the figures. In a few of the smallest specimens examined the spines are very nearly or quite as prominent as in the figures, while in other respects they are indistinguishable from specimens of the same size in which the spines are very small and inconspicuous. In all the spineless specimens there is a more or less prominent tubercle in place of the spines of the carapax. As in the next species, the spines are probably specially characteristic of the young, and become more or less obsolete as the individual increases in size, the obsolescence being more rapid in some individuals than in others. I think there is very little doubt that this species is synonymous with *C. trispinosus* Stimpson, also described from very small specimens. The following measurements show the size of the specimens examined. In the largest males the chelæ\* are stout, but little more than twice as long as broad, and the basal portion considerably swollen.

Station.	Sex.	Length of carapax.	Breadth of carapax.	Ratio.
		<i>mm.</i>	<i>mm.</i>	
874 .....	♂+♂+♂+♂+♂+♂+♂+♂+♂+♂	10.0	7.9	1: 0.79
871 .....		12.0	8.7	1: 0.73
865 .....		14.3	11.0	1: 0.76
871 .....		14.7	12.2	1: 0.77
874 .....		17.5	14.0	1: 0.80
873 .....		8.2	5.7	1: 0.70
871 .....		11.0	8.0	1: 0.73
865 .....		13.1	10.3	1: 0.78
878 .....		14.0	11.0	1: 0.78

*Euprognatha rastellifera* Stimpson, Bull. Mus. Comp. Zool. Cambridge, ii, p. 123, 1870.—A. Milne-Edwards, Crust. Région Mexicaine, p. 183, pl. 33, fig. 2, 1878.

Stations 865, 869, 871, 872, 873, 874, 877, 878; 65 to 192 fathoms; at nearly all these stations in vast numbers.

Many of the specimens are much larger than those described by Stimpson and Milne-Edwards, males often being 15<sup>mm</sup> in length of carapax. In all the large specimens the spines of the carapax are much less conspicuous than in the young; the spines upon the orbital arches, upon the gastric, cardiac, and the summits of the branchial regions, and upon the basal segment of the abdomen, are often reduced to low and inconspicuous tubercles. In large males the chelæ are nearly as long as the carapax, more than a fourth as broad as long, and the basal portion considerably swollen. The whole animal is nearly naked and very free from foreign growths of all sorts, contrasting strongly in this respect with most of the Maioidæ.

*Lambrus Verrillii*, sp. nov.

Allied to *L. Pourtalesii* Stimpson.

*Female*.—The carapax, including lateral spines, is about one and a fourth times as broad as long, with a broad longitudinal depression

\* I restrict, as Huxley has done, the term *chela* to the two terminal segments of a chelate appendage.

either side, between the branchial region and the posterior part of the gastric and the cardiac region, and with the surface rough and tuberculose. The cardiac, with the posterior part of the gastric region, is raised into a continuous ridge, capped with a longitudinal line of four large spiniform tubercles, one on the gastric and three on the cardiac, besides a small one in the middle of the posterior margin. The cardiac and the two anterior gastric tubercles are erect and their tips nearly in the same horizontal line, while the posterior cardiac is situated much lower down on the posterior slope of the carapax and is directed upward and backward. In front of the gastric tubercle there are two much smaller ones, in a transverse line, and in front of these there are usually four still smaller ones similarly disposed, so as to make a submedian line of three small tubercles either side, between the large gastric tubercle and the erect and prominent tubercle upon the crest of the orbital arch. In one of the specimens the most anterior of these three pairs of tubercles back of the orbits is obsolete. There is a deep longitudinal depression between the orbits, and extending a little back of them and forward to the narrow part of the rostrum. The rostrum is prominent, directed forward and downward, suddenly contracted just in front of the antennal fossæ, leaving a dentiform tubercle either side, where the rostrum is suddenly narrowed; there is also a small tooth either side, near the tip of the rostrum. The antero-lateral margin is strongly incurved at the cervical suture, so as to approach closely and expose slightly from above the strongly tuberculo-dentate, infero-lateral carina, which is itself slightly incurved at this point; both in front of and behind the cervical suture, however, the margin recedes from the inferior carina, in front being directed upward at an oblique angle with the part behind the cervical suture. Above this angle there is a broad, conspicuous, and nearly smooth depression in the nearly vertical surface. The margin between the cervical suture and the orbit is armed with two small tubercles near the cervical suture, but the anterior two-thirds is unarmed and slightly concave in outline. Behind the cervical suture the margin is regularly and very strongly arcuate, and in front of the great branchial tooth, which really forms the lateral angle of the carapax, is armed with nine or ten teeth, of which the first three or four are small and somewhat tuberculiform; the six posterior are larger, acutely triangular, and strongly lacinated, the four anterior of these six being nearly equal in size, the fifth larger and the sixth smaller than the others. The greatest breadth of the carapax is between the tips of the large fifth lacinated tooth each side, or, excluding the teeth, between the bases of the third and fourth teeth each side. The great branchial tooth is larger than any other, lacinated, and has a small tooth at the base in front and a larger one near the base behind; and still behind this last there is first a small and then a much larger tuberculiform spine on the concave postero-lateral margin, while the short posterior margin is armed with three prominent tubercles, with several smaller ones between. The

branchial regions are prominent, tuberculose, and pitted, particularly upon the outer surface, and rise at the summit into a prominent spiniform tubercle either side, on a line with the anterior cardiac tubercle.

The chelipeds are very nearly as in *L. Pourtalesii*, but appear to be proportionally a little longer, and, judging from A. Milne-Edwards's figure of *Pourtalesii*, to have the marginal teeth more acute and more deeply lacinated. The meri of all the ambulatory legs are spinulose on both the upper and lower edges, as in *Pourtalesii*, while in the last pair there are, in addition, similar spines on the upper edge of the carpus and one near the middle of the upper edge of the propodus. The dactyli are about as long as the corresponding propodi, are very slightly compressed, and are covered with a dense velvet-like pubescence, except at the tips.

*Measurements.*

	♀ (Sta. 865-7.)	♀ (Sta. 872.)	♀ (Sta. 872.)
	<i>mm.</i>	<i>mm.</i>	<i>mm.</i>
Length of carapax.....	24.0	26.5	32.8
Breadth including lateral spines.....	24.0	33.0	41.0
Ratio of length to breadth.....	1: 1.25	1: 1.55	1: 1.25
Breadth excluding lateral spines.....	24.0	28.0	35.3
Length of cheliped fully extended.....	57.0	65.0	85.0
Length of merus of cheliped.....	20.0	25.5	32.0
Length of propodus of cheliped.....	27.0	30.0	39.0

The conspicuous cervical emargination of the antero-lateral margin of the carapax, the cervical depression above the margin, the different antero-lateral margin in front of the cervical suture, and the spines or tubercles on the carpi and propodi of the last ambulatory legs appear clearly to distinguish this species from the *Pourtalesii*. The antero-lateral margin between the cervical suture and orbit appears to be more like *L. hyponcus*, as figured by A. Milne-Edwards, though in other respects the *hyponcus* is unlike the present species.

Stations 865 to 867, 872; 65 and 86 fathoms; three specimens, all females.

*Cancer borealis* Stimpson.—Smith, Trans. Conn. Acad., v. p. 39, pl. 8, 1879.

Stations 865, 871, 872, 875, 877, 878, 879; 65 to 225 fathoms. Most of the specimens are small, and the largest is only 56<sup>mm</sup> in breadth of carapax.

Large specimens of this species were taken in abundance in the shallow waters off Newport.

*Geryon quinquedens* Smith, Trans. Conn. Acad., v, p. 35, pl. 9, figs. 1, 2, 1879.

Stations 881, 893; 252 and 372 fathoms.

This species grows to a much greater size than any of the specimens from which my original description was drawn. A male from 210 fathoms, off Nova Scotia, north latitude 42° 37', west longitude 62° 55', presented to the National Museum by Capt. G. A. Johnson and crew of

the schooner *Augusta A. Johnson*, of Gloucester, Mass., gives the following measurements:

	mm.
Length of carapax, including frontal teeth.....	85.2
Breadth, including lateral teeth.....	101.7
Breadth in front of lateral teeth.....	93.5
Length of posterior legs.....	180.0

*Bathynaectes longispina* Stimpson, Bull. Mus. Comp. Zool. Cambridge, ii, p. 146, 1870.—A. Milne-Edwards, Crust. Région Mexicaine, p. 234, pl. 42, fig. 1, 1879,

Stations 871, 872, 874, 879; 85 to 225 fathoms.

Stimpson's and Milne-Edwards's specimens were from the Straits of Florida.

*Acanthocarpus Alexandri* Stimpson, Bull. Mus. Comp. Zool. Cambridge, ii, p. 153, 1870.

Stations 870 to 874, 877, 878; 85 to 155 fathoms. At 878, 142 fathoms, forty-nine specimens were taken.

A large part of the specimens are much larger than those described by Stimpson, which were from 74 fathoms, in Pourtalès's dredgings in the Straits of Florida. A male, from station 878, gives the following measurements: Length of carapax, 16.9<sup>mm</sup>; breadth, 16.8<sup>mm</sup>; breadth between tips of carpal spines, with the chelipeds closed, 42<sup>mm</sup>; length of carpal spine, 8<sup>mm</sup>.

*Ethusa microphthalma*, sp. nov.

*Female*.—The carapax is as broad as long, but very much narrowed anteriorly, so that in front it is only half as broad as the widest part, which is at the swollen branchial regions posteriorly. The front between the orbits is less than half as wide as the entire front, and, as seen from above, is divided by a triangular median sinus and two slightly less deep sinuses at the extremities of the antennular fossæ, and the angles between and outside of these sinuses are spiniform, so that the front between the eyes is armed with four similar and nearly equidistant spines, of which the lateral are slightly more prominent than the median. The orbital sinuses are nearly as deep as broad, and formed on the outside by the spiniform antero-lateral angles, which reach nearly as far forward as the spines of the front. The antero-lateral margins are long and nearly straight. The dorsal surface is slightly convex and not deeply areolated, though the cervical suture is well marked, and the whole surface is granular and slightly pubescent, except on the cardiac and gastric regions, where the granulation is nearly obsolete.

The eyes are small and on very short peduncles, so that they do not nearly reach the angles of the orbital sinuses; the cornea is terminal, not expanded, and the pigment is black.

The chelipeds are equal, small, and very slender; the chela is scarcely stouter than the carpus, the basal portion is smooth and nearly cylindrical, and the digits are alike, fully as long as the basal portion, strongly compressed, longitudinally grooved, slightly curved laterally,

and the prehensile edges straight and very regularly dentate. The two first pairs of ambulatory legs are nearly alike, twice as long as the chelipeds, and nearly or quite naked; the propodus is a little shorter than the merus, very slightly compressed, and smooth, but slightly grooved longitudinally; the dactylus is once and a half as long as the propodus, very much compressed vertically, slightly curved, of nearly uniform breadth to a short distance from the acuminate tip, and very smooth. The third and fourth pairs of ambulatory legs are nearly alike, scarcely half as long as the first and second, slender, and covered with short pubescence, except upon the dactyli. The propodus is much shorter than the merus, not very much shorter than the carpus, nearly cylindrical, and not expanded distally; the dactylus is very short and strongly curved.

The single specimen seen, from station 878 (142 fathoms), gives the following measurements:

	mm.
Length of carapax, including frontal spines.....	13.5
Greatest breadth of carapax .....	14.0
Breadth between antero-lateral spines .....	7.0
Breadth between tips of inner angles of orbital sinuses.....	3.1
Length of cheliped.....	18.0
Length of chela.....	8.0
Breadth of chela.....	1.7
Length of dactylus.....	4.0
Length of second ambulatory leg.....	38.0
Length of its propodus .....	8.0
Length of its dactylus.....	12.0
Length of fourth ambulatory leg.....	18.0
Length of its propodus .....	3.6
Length of its dactylus.....	1.5

The very small eyes and the great breadth and prominent antero-lateral angles of the carapax at once distinguish this species from *E. mascarone*, of the Mediterranean, and from the Japanese *E. serdentata*. It is also evidently distinct from *E. granulata* Norman, which, however, has apparently not been fully described. The genus has not, I think, been recorded from America before, although a species occurs in the Bay of Panama.

#### ANOMURA.

*Latreillia elegans* Roux, Crust. Méditerranée, pl. 22, 1828.—Milne-Edwards, Hist. Nat. Crust., i, p. 277, 1834.—De Haan, Fauna Japonica, p. 108, 1837.—Lucas, Explor. de l'Algérie, Animaux Articulés, i, p. 3, pl. 1, fig. 1, 1849.—Heller, Crust. südlichen Europa, p. 147, pl. 4, fig. 14 (anterior part of carapax after Lucas).

Station 872, 86 fathoms (three females); 874, 85 fathoms (fragment of carapax).

I have had no European specimens for comparison, and have seen only a tracing of Roux's figure, with which the specimens before me agree well. In these specimens the propodus in the posterior pair of legs is a little more than two-thirds as long as the merus, and the dactylus is very short and closes against the somewhat oblique and spinous

distal extremity of the inferior edge of the propodus, which is ciliated along the rest of its length, while the merus is not ciliated. In Lucas's general figure the propodus is proportionally about a fourth shorter and the dactylus several times as long as in the specimens, the dactylus being very much as in the first three pairs of ambulatory legs; but the enlarged figure, 1 *c*, of the terminal portion of the posterior leg is very different. The part apparently corresponding to the dactylus in the general figure is represented as composed of two segments, a shorter terminal one like the dactylus in the specimens, and a longer basal one like the terminal part of the propodus. I think there is little doubt that these figures were drawn from a specimen in which the very slender and delicate propodus of the posterior leg was partially broken and bent at about a fourth of the way from the tip to the base, and that the artist mistook the break for a natural articulation, and so represented it. Supposing this to be the case, Lucas's enlarged figure agrees very well with the specimens before me.

**Homola barbata** White, List Crust. British Museum, p. 55, 1847.—*Cancer barbatus* Fabricius, Entomologia Systematica, ii, p. 460, 1793.—Herbst, Krabben und Krebse, pl. 42, fig. 3.—“*Dorippe spinifrons* Lamarek, Animaux sans Vertèbres, v, p. 245, 1818” (Heller).—*Homola spinifrons* Leach, Trans. Linnean Soc. London, xi, p. 324, 1815; Zoological Miscellany, ii, p. 82, pl. 88, 1815.—Desmarest, Considérat. Générales Crust., p. 134, pl. 17, fig. 1, 1825.—Milne-Edwards, Hist. Nat. Crust., ii, p. 183, pl. 22, figs. 1-4, 1837; Règne Animal de Cuvier, 3<sup>me</sup> édit., pl. 39, fig. 2.

Station 872; 86 fathoms; two males, the larger 19<sup>mm</sup> in length of carapax.

I have had no Mediterranean specimens for comparison, but the two before me agree perfectly with the figures and descriptions above referred to.

**Lyreidus Bairdii**, sp. nov.

*Female*.—The carapax is regularly and strongly convex transversely, about one and three-fourths times as long as the breadth at the antero-lateral angles, back of which it narrows only slightly for half the length of the lateral margins, which then curve regularly round to the articulation with the abdomen. The rostrum, or median tooth of the deeply tridentate front, is acutely triangular, the breadth at base being equal to about half the length and greater than the distance between its tip and that of either of the lateral spines, which are spiniform, very acute, and directed forward. The orbital sinuses left between the median and lateral teeth are nearly as deep as broad and broadly rounded behind. The edge of the antero-lateral margin is rounded, but is armed with a small tubercle about a third of the way from the lateral to the anterior angle, and in front of this tubercle the carapax is suddenly narrowed, so that the margin in front of the tubercle is concave in outline as seen from above. The posterior half of the lateral margin is marked above by a distinct carina, but the anterior half is smoothly rounded.

The eye-stalks scarcely reach the tips of the lateral teeth of the front,



are broad at base, and narrowed to triangular tips. The eyes themselves are very small, black, and situated on the outer and inferior edge of the eye-stalks.

The chelipeds are nearly as long as the carapax, and similar in form to those of *L. tridentatus*. The propodus is short and very much compressed; the distal margin is transverse and nearly as long as the length of the whole segment; the dorsal edge is thin and sharp, and terminates in a sharp tooth near the articulation of the dactylus; back of the thin digital process the inferior edge is armed with three or four acute teeth, decreasing in size proximally. The dactylus is compressed and very thin, with the outer edge regularly curved and sharp; the prehensile edge is sharp and slightly irregular in outline, but not dentate, although the opposing edge of the propodus is armed with about five low teeth inside the lip. The first, second, and fourth pairs of ambulatory legs are very nearly as in *L. tridentatus*, as figured by De Haan. In the third pair, however, the propodus is nearly twice as broad as long, the inferior edge being expanded into a very thin, broad, lamellar process nearly as large as the body of the segment, and with a ciliated and regularly curved margin nearly semicircular in outline. The dactylus is nearly as broad as the propodus, lamellar throughout, articulated at the upper end of the proximal margin, which, below the articulation, is concave in outline and ciliated to match the adjoining lamellar process of the propodus; the lateral margins are naked and convex in outline, except near the tip, which is sharply acuminate.

The abdomen is slightly more than two-thirds as long as the carapax, and agrees very closely with De Haan's figure of the abdomen of the male of *L. tridentatus* in the form and proportions of the somites. In its natural position, the abdomen is bent at the fourth somite, and this somite is armed with a small spiniform tubercle, projecting from the middle of the dorsal surface.

The dorsal surface of the carapax and of the abdomen, the sternum, and the exposed surface of the external maxillipeds and of the chelipeds and ambulatory legs are naked, smooth, and highly polished, though the dorsal surface of the carapax is minutely punctate, the punctations being more numerous on the anterior portions. The subhepatic and the adjacent anterior pleural regions are slightly hairy or pubescent.

Professor Verrill tells me that the color of the entire animal shortly after it was placed in alcohol, and before the color could have changed materially from that in life, was light orange-red.

The single specimen, from which the above description is drawn, gives the following measurements:

	mm.
Length of carapax, including rostrum .....	38.4
Breadth of carapax just back of lateral spines .....	22.0
Breadth of carapax between tips of lateral spines.....	22.5
Breadth of front between tips of lateral spines .....	6.8
Length of rostrum.....	4.0
Length of abdomen .....	25.0

Station 873; 100 fathoms.

Another and very much smaller specimen, from station 876, 120 fathoms, though differing very much from the larger specimen, is probably the young of the same species. The carapax of this specimen is proportionately longer; the orbital sinuses are much larger; the lateral spines of the front are more slender and much longer, longer even than the rostral tooth, and curved slightly outward and upward toward the tips; and the lateral spines are much longer and directed more outward. There is a small tubercle upon the third somite of the abdomen, and in place of the tubercle on the fourth somite there is an acute spine, much longer than the somite itself. There is also a small spiniform tubercle on the lower side of the ischium of the third pair of ambulatory legs.

	mm.
Length of carapax, including rostrum.....	10.3
Breadth of carapax just back of lateral spines .....	5.7
Breadth of carapax between tips of lateral spines . .....	6.8
Breadth of front between tips of lateral spines .....	3.6
Length of rostrum.....	1.5

#### Hemipagurus, gen. nov.

The genus for which this name is proposed is allied to *Spiropagurus* Stimpson (Proc. Acad. Nat. Sci. Philadelphia, x, 1858, p. 236 (74), 1859), but differs conspicuously in the form and position of the sexual appendage of the last thoracic somite of the male. In *Spiropagurus* this appendage (formed by the permanent extrusion of a portion of the vas deferens) arises from the coxa of the *left* side of the last thoracic somite; while in the genus here proposed it arises from the corresponding coxa of the *right* side, is shorter than in *Spiropagurus*, and curved in one plane round the right side of the abdomen.

The carapax is short and broad, and the anterior margin is obtuse, and does not wholly cover the ophthalmic somite between the eyes. The portion in front of the cervical suture is indurated, but all the rest of the carapax is very soft and membranaceous, without any distinct induration along the cardiaco-branchial suture. The ophthalmic scales are well developed. The eye-stalks are short and the cornea expanded. The antennulæ, antennæ, and oral appendages are similar to those in *Eupagurus*; the exopods of all the maxillipeds are, however, proportionally much longer than in that genus. There are eleven pairs of phyllobranchiæ, arranged as in *Eupagurus bernhardus*, but the two anterior pairs connected with the external maxillipeds are very small and rudimentary, and composed of a few slightly flattened papillæ, so that they are, strictly speaking, trichobranchiæ. The chelipeds are slender and unequal. The first and second pairs of ambulatory legs are long, and have slender, compressed, and ciliated or setigerous dactyli; the third pair are only imperfectly subcheliform.

In the male, the second, third, and fourth somites of the abdomen bear small appendages upon the left side, as in most of the allied genera,

but the fifth somite is destitute of an appendage; in the female, the appendages of the second, third, and fourth somites are biramous and ovigerous, and there is usually a rudimentary uniramous appendage upon the fifth somite, as in the allied genera.\* The uropods are very nearly or quite symmetrical, the rami of the right appendage being very nearly or quite as large as that of the left. The telson is bilobed at the extremity.

As might be expected, the unsymmetrical development of the external sexual appendages of the males of the two species here described corresponds to a like unsymmetrical development of the internal sexual organs, and the following incomplete observations, made on ordinary alcoholic specimens in which the abdominal viscera are not sufficiently well preserved for a full anatomical or histological investigation, appear of sufficient importance to notice here, especially as nothing appears to be known of the internal structure of either species of *Spiropagurus*.

The right testis and vas deferens are much larger than the left. The lower part of the right vas deferens, in all the adults examined, is much more dilated than the left, and is filled (as is also the external part of the duct) with very large spermatophores of peculiar form. The left vas deferens is slender, much as in *Eupagurus bernhardus*, terminates in a small opening in the left coxa of the last thoracic somite, as in ordinary Paguroids, and contains spermatophores somewhat similar in form and size to those of *Eupagurus bernhardus*. In alcoholic specimens of *H. socialis* the spermatophores from the left vas deferens are approximately  $0.16^{\text{mm}}$  long and  $0.035^{\text{mm}}$  broad, with a slender neck about a third of the entire length, and a very thin and delicate lamella for a base. The spermatophores from the right vas deferens are over  $2^{\text{mm}}$  in total length; the body itself is oval, approximately  $0.40^{\text{mm}}$  long and a third as broad; at one end it terminates in a very long and slender process, two or three times as long as the body; at the other end there is a similar but slightly stouter process, a little longer than the body, and expanding at its tip into a broad and very delicate lamella, approximately  $0.35^{\text{mm}}$  long by  $0.20^{\text{mm}}$  broad. The contents of the two kinds of spermatophores are, of course, not in a condition to show the structure of the spermatozoa, but they present a similar appearance in each case, and are apparently of about the same size.

**Hemipagurus socialis, sp. nov.**

*Male*.—The part of the carapax in front of the cervical suture is about a fifth broader than long; the sides nearly parallel; the front margin sinuous, curving slightly forward in the middle and each side between the eye-stalks and the peduncles of the antennæ, the middle lobe thus formed being scarcely more prominent than the lateral lobes, each of

\* In many of the best preserved and most perfect females of *Hemipagurus socialis* examined I can find no trace whatever of this appendage of the fifth somite, while in others it is very easily seen.

which is armed with a minute spine, projecting forward just inside of the peduncle of the antenna; between these spines the edge of the front is upturned in a sharp marginal carina, which terminates each side in the spines themselves. The dorsal surface of this part of the carapax is convex in both directions, the protogastric lobes are protuberant and well marked, and nearly the whole surface is roughened, and more or less tuberculose, with transverse scabrous elevations, which give rise to numerous hairs. The branchial regions are slightly swollen, so that the breadth of the carapax posteriorly is greater than in front. All the portions back of the cervical suture are smooth and membranaceous.

The eye-stalks are about half as long as the carapax in front of the cervical suture, flattened and expanded distally, where they are about three-fourths as broad as long. The eye itself is black, and the cornea extends round either side so as to be crescent-shaped as seen from above. The ophthalmic scales are less than half as long as the eye-stalks, narrow, triangular, and acute.

The first and second segments of the peduncle of the antennula are subequal in length, and the ultimate segment nearly once and a half as long as the penultimate, and almost as long as the eye-stalks. The superior, or major, flagellum is nearly as long as the ultimate segment of the peduncle; the thick, ciliated basal portion consists of about fourteen segments, and the slender terminal portion, which is nearly once and a half as long as the basal, of about five very slender and subequal segments. The minor flagellum is about two-thirds as long as the major, and composed of about eight segments. The peduncle of the antenna reaches by the eye nearly the length of the last segment, which is about as long as the greatest diameter of the eye. The acicle is slender, acute, and slightly longer than the last segment of the peduncle. The flagellum reaches beyond the tips of the ambulatory legs.

The chelipeds are slender and very nearly equal in length, but the right is very much stouter than the left. In the right cheliped the merus and carpus are subequal in length, together nearly twice as long as the carapax, and both are rough and obscurely spinous, the spines being most conspicuous on the edges of the upper surface of the carpus, which is fully three times as long as broad, flattened above, and angular, but not distinctly carinated along either side. The chela is not far from twice as long as the carpus, nearly three times as long as broad, compressed vertically, evenly rounded, smooth and nearly naked above, but clothed with long, soft hair beneath; the digits are longitudinal, not gaping, and the dactylus is about two-thirds as long as the basal portion of the propodus, and its prehensile edge is armed with a broad tooth near the middle. In the left cheliped the merus and carpus are similar to those of the right, but much more slender and a little longer; the carpus is about six times as long as broad, and the edges of the upper surface are rather more sharply angular than in the right; the chela is shorter than the right, but very slender, smooth, and nearly

naked; the digits are similar, longitudinal, slightly longer than the basal portion of the chela, compressed, slightly curved downward toward the tips, but the prehensile edges straight and very minutely serrate.

The ambulatory legs are very nearly equal in length, and slightly overreach the chelipeds; the merus is about as long as the left chela, and roughened with small spines on the upper and under edges; the propodus is shorter than the merus, compressed, smooth, and ciliated along the edges; the dactylus is a little longer in the second than in the first pair, but in both shorter than the propodus, very strongly compressed, very slightly twisted, about ten times as long as broad, and thickly ciliated along both edges, except for a short distance along the lower edge near the tip.

The *female* is smaller than the male, and has proportionally shorter ambulatory legs, and chelipeds very much shorter and much more alike. The right chela is only about a third longer than the carpus, little more than a third as broad as long, and the digits are slender and nearly as long as the basal portion. The left cheliped is proportionally stouter than in the male, and thus approximates to the right; the chela itself is scarcely more than a third longer than the carpus. The ambulatory legs overreach the chelipeds by nearly or quite the full length of the dactyli, but all the segments have very nearly the same relative proportions as in the male.

The eggs are few in number and very large, being about a millimeter in diameter in alcoholic specimens.

In young males the chelipeds and ambulatory legs are similar to those of the female.

*Measurements.*

	♂		♀
	(Sta. 877).	(Sta. 878.)	(Sta. 878).
	<i>mm.</i>	<i>mm.</i>	<i>mm.</i>
Length from front of carapax to tip of abdomen.....	19.0	16.5	16.0
Length of carapax along median line.....	7.7	6.3	5.6
Length of carapax from front to cervical suture.....	5.3	4.7	4.0
Breadth of carapax in front.....	6.5	5.3	4.8
Length of eye-stalks.....	2.9	2.6	2.5
Greatest diameter of eye.....	2.1	1.8	1.7
Length of peduncle of antennula.....	6.0	5.5	5.1
Length of ultimate segment of the same.....	2.7	2.4	2.2
Length of peduncle of antenna beyond front.....	4.5	4.0	3.4
Length of ultimate segment of peduncle of antenna.....	2.1	1.9	1.7
Length of right cheliped.....	32.0	24.8	15.5
Length of carpus.....	7.0	5.5	4.0
Length of propodus.....	12.7	10.0	5.4
Breadth of propodus.....	4.5	3.4	1.9
Length of dactylus.....	5.6	4.5	2.8
Length of left cheliped.....	28.0	21.0	15.1
Length of carpus.....	7.6	6.3	4.0
Length of propodus.....	10.0	8.0	5.1
Breadth of propodus.....	2.1	1.7	1.3
Length of dactylus.....	5.7	4.5	2.8
Length of first ambulatory leg, right side.....	34.0	28.0	21.0
Length of propodus.....	8.4	6.8	5.2
Length of dactylus.....	6.8	5.3	5.0
Length of second ambulatory leg, right side.....	34.5	28.2	21.5
Length of propodus.....	8.9	7.2	5.8
Length of dactylus.....	8.0	7.0	6.0

The carcinœcium is very rarely a naked gastropod shell; in most of the specimens seen it is either built up by a colony of *Epizoanthus Americanus*, like the carcinœcium of *Eupagurus Kröyeri*, from the same stations, or is made up in a somewhat similar way by the single polyp of a species of *Adamsia*, the base secreted by the *Adamsia* being expanded on either side and united below so as to inclose the crab in a broadly conical cavity, with only a slight spiral curvature. The nuclei about which these polypean carcinœcia are formed are of various origins; the majority of the *Adamsia* carcinœcia appear to have been built upon fragments of pteropod shells, in some cases upon bits of worm-tubes, in one case upon the entire shell of a *Cadulus*, the greater part of the shell being left protruding from the base of the polyp. In the carcinœcia formed by *Epizoanthus* the nucleus seems usually to have been absorbed, so that nothing is left distinguishable from the colony of polyps itself. In some cases the *Adamsia* has completely overgrown a small *Epizoanthus* carcinœcium, so that when the *Adamsia* is removed a perfect *Epizoanthus* carcinœcium is found beneath as a nucleus. The carcinœcium of this species, and of *H. gracilis* as well, does not cover the animal to the same extent as is usual in the species of *Eupagurus*, the anterior part of the carapax evidently being constantly exposed, its induration fitting the animal for such exposure. The *Epizoanthus* carcinœcia are, however, very often disproportionally large for the crabs inhabiting them, having grown out either side until they are several times broader than long. In spite of these often enormous carcinœcia, both species of the genus probably swim about by means of the ciliated dactyli of the ambulatory legs, as *Spiropagurus spiriger* has been observed to do by Stimpson (Proc. Acad. Nat. Sci. Philadelphia, 1858, p. 248 (86), 1859).

Stations 865, 870, 871, 872, 873, 874, 876, 877, 878, 880; 65 to 252 fathoms. At many of these stations it occurred in very great abundance.

#### *Hemipagurus gracilis*, sp. nov.

This is a smaller and more slender species than the last, and is readily distinguished from it by the smooth carapax, the longer and more slender eye-stalks, the long and acicular ophthalmic scales, and by the narrow dactyli of the ambulatory legs being longer than the corresponding propodi.

*Male*.—The carapax in front of the cervical suture is flat, smooth, nearly naked, and scarcely at all areolated. The anterior margin is rather more strongly sinuous than in *H. socialis*, and the lateral lobes are slightly angular and each is tipped with a minute spine, as in that species, but the marginal carina between these spines is much less distinct.

The eye-stalks are more than half as long as the carapax in front of the cervical suture, flattened and expanded distally, but only about half as broad as long. The eyes themselves are as in *H. socialis*. The ophthalmic scales are more than half as long as the eye-stalks, and are acicular and regularly acute.

The ultimate segment of the peduncle of the antennula is as long as

the eye-stalk and nearly twice as long as the penultimate segment. The major flagellum is as long as the ultimate segment of the peduncle, the basal portion of about eight segments, the terminal portion three times as long and of about five subequal and very slender segments. The minor flagellum is about half as long as the major, and composed of about six segments. The antennæ are very much as in *H. socialis*.

The chelipeds are nearly equal in length and similar to those of *H. socialis*, but in the right cheliped the inner edge of the upper surface of the carpus is angular, and armed with a regular series of twelve to eighteen small spines, while the outer edge is rounded and unarmed; and the prehensile edge of the dactylus is armed with two irregular and indistinct teeth, corresponding with two irregular emarginations in the edge of the digital portion of the propodus. In the left cheliped the outer edge of the upper surface of the carpus is slightly rounded and scarcely at all spinulose, while the inner edge is armed as in the right cheliped. The left chela differs from that of *H. socialis* in having the digital portion of the propodus considerably stouter than the dactylus, particularly toward the base.

The ambulatory legs are proportionally as long but more slender than in *H. socialis*; in both pairs the dactylus is longer than the propodus, curved slightly near the tip, about sixteen times as long as broad, sparsely ciliated along the upper edge, and very slightly setigerous along the lower.

The female differs from the male as in *H. socialis*, but to a very much less extent, the chelipeds and ambulatory legs being only a little shorter than in the male, and the right cheliped only a little less stout and a little more like the left than in the male.

The eggs are few and nearly as large as in *H. socialis*.

Measurements.

	♂ (Sta. 874).	♀ (Sta. 874).
	mm.	mm.
Length from front of carapax to tip of abdomen.....	12.0	11.2
Length of carapax along median line.....	3.4	3.2
Length of carapax from front to cervical suture.....	2.2	2.1
Breadth of carapax in front.....	2.8	2.4
Length of eye-stalks.....	1.6	1.5
Greatest diameter of eye.....	1.1	0.9
Length of peduncle of antennula.....	3.4	3.2
Length of ultimate segment of the same.....	1.6	1.5
Length of peduncle of antenna beyond front.....	2.3	1.9
Length of ultimate segment of peduncle of antenna.....	1.0	0.8
Length of right cheliped.....	15.2	11.2
Length of carpus.....	4.0	2.8
Length of propodus.....	6.0	4.4
Breadth of propodus.....	2.4	1.8
Length of dactylus.....	2.0	1.7
Length of left cheliped.....	13.6	10.0
Length of carpus.....	3.8	2.6
Length of propodus.....	5.0	3.6
Breadth of propodus.....	1.1	1.0
Length of dactylus.....	2.5	1.9
Length of first ambulatory leg, right side.....	16.1	12.8
Length of propodus.....	4.0	3.2
Length of dactylus.....	5.0	4.0
Length of second ambulatory leg, right side.....	17.0	14.0
Length of propodus.....	4.6	3.7
Length of dactylus.....	5.4	4.5

The carcinœcium in all the specimens examined is a colony of *Epizoanthus*, but this species, like *H. socialis*, probably sometimes inhabits an *Adamsia* carcinœcium.

Stations 865, 870, 871, 874, 877, 878; 65 to 155 fathoms; associated with *H. socialis*, but not at all abundant.

*Parapagurus pilosimanus* Smith, Trans. Conn. Acad., v, p. 51, 1879.

Stations 880, 893, 894; 252 to 372 fathoms.

Since this species was described, from a single specimen taken in 250 fathoms off Nova Scotia, a few additional specimens have been brought in by fishermen from deep water off Nova Scotia. In all the specimens seen, the carcinœcium is built up by a compound actinoid polyp, as in the specimen first described. Some of the young specimens show very plainly the gastropod shell, which serves as a nucleus about which the polypean carcinœcium is built.

*Eupagurus bernhardus* Brandt ex Linné.

Station 865; 65 fathoms; two small specimens.

*Eupagurus Kröyeri* Stimpson.

Stations 869, 870, 877, 878; 126 to 192 fathoms; many specimens, mostly small, and all in carcinœcia formed by colonies of *Epizoanthus Americanus*.

*Eupagurus*, sp.

Stations 865 to 867, 869 to 874, 876 to 880, 893 to 895; 65 to 365 fathoms.

A species of about the size of *E. Kröyeri*, and quite distinct from the species heretofore known upon our coast, and apparently distinct from all the described European species.

?*Munida Caribæa* Stimpson, Ann. Lyceum Nat. Hist. New York, vii, p. 241 (116), 1860.

Stations 865, 871 to 874, 877, 878; 65 to 142 fathoms. Very abundant at 871; 115 fathoms.

It is with considerable hesitation that I refer these specimens to Stimpson's species, which was very briefly described, apparently from a single very small specimen, and with no more precise indication of its habitat than is implied in the specific name. Very small specimens of the species before me agree very well, however, with Stimpson's description, except that he says, "eye-peduncles longer and the cornea less dilated than usual", while in the species before me the eye-stalks are just about as long as in *M. Banffia* and the cornea fully as much expanded horizontally, though considerably more compressed vertically; but this vertical compression is perhaps what Stimpson referred to in speaking of the cornea as "less dilated than usual".

The species in hand resemble *M. tenuimana* G. O. Sars in the length and slenderness of the chelipeds, which are even longer and more slender than in that species, from which, however, it is sufficiently distinct.



The armature of the carapax, chelipeds, and ambulatory legs is more like *M. Bamflia* than *texuimana*. There are usually six subequal and nearly equidistant spines upon the anterior half of the lateral margin of the carapax, of which one is in front of the cervical suture, three upon the hepatic region, and two upon the anterior part of the branchial region. There are no spines upon the posterior border of the carapax and none upon the abdomen, except two very small ones on the anterior edge of the second somite. The chelipeds are very long and slender, in large specimens being a half or more longer than the entire body, nearly cylindrical, and the merus and carpus sparsely armed with small spines; but the chela, which is longer, but no stouter, than the merus, is without spines.

Four specimens give the following measurements:

	♂	♀	♂	♂
	mm.	mm.	mm.	mm.
Length.....	48.5	48.0	23.0	17.5
Length of carapax, including rostrum.....	25.0	24.2	12.3	9.2
Length of rostrum.....	9.1	8.9	4.9	3.4
Breadth of carapax in front of cervical suture.....	11.1	11.7	5.7	4.1
Greatest breadth, excluding spines.....	13.7	14.0	6.2	4.8
Breadth near posterior margin.....	12.3	13.0	6.0	4.5
Length of cheliped.....	44.0	79.0	36.5	22.8
Length of merus.....	34.3	32.0	14.8	8.3
Length of carpus.....	6.0	5.0	3.0	2.0
Length of chela.....	39.0	36.0	15.9	9.8
Length of dactylus.....	17.0	17.4	7.2	4.3
Length of first ambulatory leg.....	50.0	47.7	22.0	14.0
Greatest diameter of eye.....	4.0	4.0	3.6	2.0

MACRURA.

*Arctus depressus*, sp. nov.

This species is represented only by a single, small, and probably immature individual, but is apparently distinct from any known species of the genus, and is readily distinguished by the very broad and greatly depressed cephalo-thorax, which in these respects is like *Ibacus*, and by the conspicuous spines each side of the posterior segments of the sternum. The depressed form is perhaps partially a character of immaturity, being an approach to the *Phyllosoma*-stages, and it is possible that the sternal spines disappear in the adult.

The carapax is less than half as thick as broad, and the breadth is much greater than the length along the middle line above, but slightly less than the length of the lateral margin, which is convex in outline, so that the greatest breadth is near the middle of the length. The anterolateral angles are acute and very prominent, extending far forward of the rest of the front and to a line slightly in advance of the first dorsally exposed segment (the true second peduncular) of the antenna each side. The orbits are very large, almost completely open in front, and occupy fully a third of the width of the whole front. The median carina is low, being, even in the middle of its length, only a little higher than the lateral carina, and rises into two low, dentiform prominences, one

at about the middle of the carapax and another a little back of the anterior margin, and in front of the latter the carina is almost wholly obsolete. The lateral carinæ are prominent along the inner sides of the orbits, terminating in front in the elevated and irregularly dentate inner angles of the orbits. Just back of the orbit there is a hiatus in the carina, from which the carina extends uninterruptedly to near the posterior margin, though its crest is minutely and obscurely dentate. The surface of the longitudinal depressed spaces between the median and lateral carinæ are naked and nearly smooth, and so is the narrow and slightly concave space between each lateral carina and the edge of the carapax, except for a line of small tubercles just outside the carina and a few additional ones outside of these, near the postero-lateral angle. The lateral margin is thin and the edge sharp, and divided by a sharp incision at the cervical suture, by an incision slightly less deep a little way back of the cervical suture, and by two or three obscure notches along the branchial region, while the edge between these incisions and notches is irregularly and very minutely dentate.

The eyes are large, with an expanded cornea, and black. The two lobes of the antennular somite rise in front into small dentiform tubercles, and so do the first and second of the dorsally exposed segments of the antennæ. The second exposed segment of the antenna is about as broad as long, carinated above, acutely angular in front, and the inner and outer edges are each armed with three teeth, of which the anterior in each case is obscure. The terminal segment is short, and the slightly arcuate anterior margin is deeply five-lobed.

The sternum is triangular and very broad, the breadth between the bases of the posterior legs being nearly as great as the length along the median line. The edges are slightly raised above the bases of the legs, and terminate posteriorly, back of and below the base of the fifth leg, in a conspicuous spine, directed backward.

The abdomen, to the tip of the telson, is twice as long as the carapax along the median line above, is at base much narrower than the carapax, and tapers regularly and so rapidly that at the sixth somite it is little more than two-thirds as broad as at base. There is a slight median carina on the second to the fifth somite, and the dorsal surface is naked and sparsely punctate, but otherwise nearly smooth. The pleura of the second, third, fourth, and fifth somites are nearly perpendicular and slightly carinated in the middle; the second is broader than the others and nearly right-angled, but terminates in a spiniform tip, turned backward; the third is angular, but not spiniform at the extremity; and the fourth and fifth are obtuse or rounded. The sixth somite is about as long as, but considerably narrower than, the fifth, and its pleura are small and narrowly triangular. The telson is much longer than broad, tapers very slightly distally; the posterior portion is very thin, delicate, and transparent, and the posterior edge is slightly curved and the angles rounded. The lamellæ of the uropods are as long as and much broader

than the telson, and, except a small portion near the base, are thin and transparent like the terminal part of the telson.

*Measurements.*

	mm.
Length from front of carapax to tip of telson .....	18.7
Length from tips of antennæ to tip of telson .....	23.2
Length of carapax along median line above .....	6.2
Length of carapax along lateral margin .....	9.0
Greatest breadth of carapax .....	8.3
Breadth between anterior angles .....	7.5
Breadth posteriorly .....	6.2
Greatest thickness of cephalo-thorax .....	3.5
Breadth of first somite of abdomen .....	6.1
Breadth of sixth somite of abdomen .....	4.0

Station 872; 86 fathoms.

In the outline of the edges of the segments of the antennæ and in the divisions of the carinae of the carapax this species is much like *A. Americanus* Smith (Amer. Journ. Sci., II, xlvii, p. 119, 1839; *Scyllarus (Arctus) Gundlachi* von Martins, Archiv für Naturgesch., xxxviii, p. 123, pl. 5, fig. 13, 1872), the young of which it may possibly prove to be, though this seems very improbable considering that the specimen just described is half as long as ordinary specimens of *A. Americanus*, which is known from the Gulf of Mexico and the West Indies.

***Nephropsis aculeatus*, sp. nov.**

Very closely allied to *Nephropsis Stewarti* Wood-Mason (Journ. Asiatic Society of Bengal, xlii, part ii, p. 39, pl. 4, 1873), described from a single female, 98<sup>mm</sup> long and wanting the chelipeds, dredged in 260 to 300 fathoms in the Bay of Bengal.

*Male*.—In specimens 30<sup>mm</sup> to 34<sup>mm</sup> in length the rostrum is very slightly longer proportionately than represented in the figures of *N. Stewarti*, but in all other respects the carapax shows no differences whatever. The abdomen is as represented in the figure of *N. Stewarti*, except that the pleura of the second to the fifth somite, inclusive, project farther downward and terminate in slender, acuminate, and spiniform tips, and that the pleuron of the sixth somite is sharply right-angled below, and not rounded. The uropods and telson show no differences whatever.

The chelipeds are equal, or very nearly so, about a fourth longer than the carapax, including the rostrum, and are carried with the chela held horizontally, as in *Nephrops* and *Homarus*. The merus is about as long as the rostrum, and is armed near its distal end with a slender spine above and a similar one below. The carpus is short, a little longer than broad, slightly broader than the distal part of the merus, and is armed with three small spines—one near the middle of the inner edge, one at its distal end, and another beneath at the articulation with the chela. The chela is scarcely longer than the merus and slightly broader than the carpus, somewhat compressed vertically, rounded above and below, and

without spines, except a few very minute dentiform ones along the inner edge of the propodus; the propodal digit is longitudinal and tapers to a slender incurved tip; the dactylus is a little longer and stouter than the propodal digit, and has a longer and more strongly curved tip, which closes beneath the tip of the propodus; the prehensile edges of both digits are sharp and minutely crenulate. The upper surface and the inner edge of the carpus and the upper surface and both edges of the chela are thickly clothed with very long and soft pubescence, directed distally. The succeeding pairs of legs are very nearly as in *N. Stewarti*. The second pair are about three-fourths as long as the chelipeds, slender and perfectly chelate. The third pair are a little longer than the second and not quite as perfectly chelate. The fourth are a little longer than, and the fifth about as long as, the chelipeds.

Very imperfect *female* specimens, considerably larger than the males above described, have the chelipeds a little larger and stouter proportionally than in the males, and the pleura of the second to the fifth somite of the abdomen very slightly less prolonged, but still acuminate and spiniform, and very different from *N. Stewarti*.

One of the males and an imperfect female give the following:

*Measurements.*

	♂	♀
	<i>mm.</i>	<i>mm.</i>
Length from tip of rostrum to tip of telson .....	34.0	.....
Length of carapax, including rostrum .....	16.4	.....
Length of rostrum .....	7.0	.....
Length of rostrum in front of spines .....	4.6	.....
Breadth of carapax .....	5.5	.....
Height of carapax .....	6.0	.....
Length of chelipeds .....	20.0	22.0
Length of merus .....	7.0	11.0
Length of carpus .....	3.5	5.0
Length of chela .....	7.1	12.5
Breadth of chela .....	2.3	4.9
Length of dactylus .....	4.0	6.2
Length of second pair of legs .....	15.5	24.0
Length of merus .....	5.7	9.0
Length of carpus .....	2.6	4.0
Length of chela .....	3.8	6.7
Breadth of chela .....	0.8	1.3
Length of dactylus .....	1.4	2.2
Length of third pair of legs .....	17.5	27.0
Length of carpus .....	3.1	4.8
Length of propodus .....	5.3	8.0
Breadth of propodus .....	0.5	0.8
Length of propodal digit .....	1.1	1.8
Length of dactylus .....	1.9	2.1
Length of fourth pair of legs .....	22.0	33.0
Length of propodus .....	5.2	7.9
Length of dactylus .....	2.8	4.8
Length of fifth pair of legs .....	20.5	31.0
Length of propodus .....	5.0	7.3
Length of dactylus .....	3.0	4.5
Length of telson .....	3.9	.....
Breadth of telson .....	2.6	.....

Station 873; 100 fathoms (3 males). Station 876; 120 fathoms (one very imperfect female from the stomach of *Lopholatilus*). Station 877; 126 fathoms (fragments of two or three specimens).

As Wood-Mason has remarked, the genus *Nephropsis* is closely allied

to *Nephrops*. The structure and arrangement of the branchiæ were apparently not examined by Wood-Mason, but in our species they agree with *Nephrops Norvegicus*, there being nineteen branchiæ upon each side, arranged like the nineteen posterior branchiæ of each side of *Homarus*. The branchia of the second maxilliped is wholly wanting, unless it is represented by a minute, papilla-like process near the base of the epignath. The oral appendages agree perfectly with those of *Nephrops Norvegicus*. The densely pubescent chelipeds, however, are very different from the naked and carinated chelipeds of *Nephrops*, and probably afford an additional generic distinction.

*Axius armatus*, sp. nov.

*Female*.—The carapax is strongly compressed, about twice as long as high, smooth and nearly naked. The rostrum is narrow, acuminate, spiniform at the tip, and armed along each edge with four or five slender, acute, and spiniform teeth, directed forward and slightly upward. From the edge of the rostrum a sharp lateral carina runs back on each side more than a third of the way to the cervical suture. The dorsal carina is sharp anteriorly, extends back nearly to the cervical suture, but anteriorly only as far as the posterior marginal teeth of the rostrum, and is armed with two spiniform teeth just back of the base of the rostrum. About half way between the dorsal and lateral carinæ there is a very distinct subdorsal carina, parallel with and extending back nearly as far as the dorsal, and in front turned abruptly inward opposite the posterior dorsal tooth, but not quite reaching the dorsal carina.

The eyes are small and black.

The peduncle of the antennula reaches by the tip of the rostrum the full length of the last segment, and the flagella are subequal in length and about as long as the carapax. The third segment of the peduncle of the antenna is armed with a slender spine on the lower side of the distal end. The distal spine on the second segment, at the base of the acicle, is slender, acute, and more than half as long as the rest of the segment, while the acicle is slender, straight, and as long as the fourth segment, which is slender, and about as long as the second segment together with its distal spine. The fifth, or last, segment is not more than a third as long as the fourth. The flagellum is more than twice as long as the carapax.

The merus of the external maxilliped is armed at the distal extremity of the lower edge with two very long and slender spines.

The larger cheliped is about twice as long as the carapax, and the chela itself, to the tip of the dactylus, is nearly as long as the carapax. The propodus is strongly compressed, about half as broad as the entire length and three-fourths as broad as the length of the basal portion, which is convex on both sides and has the edges sharp and carinated. The digital portion is longitudinal, about three-fourths the entire length, more than half as long as the basal portion, slightly upturned at the tip,

and armed with a stout tooth near the middle of the prehensile edge. The dactylus is as long as the basal portion of the propodus, about three-fourths longer than the propodal digit, strongly curved toward the tip, and the prehensile edge is sharp and minutely crenulate, but not toothed, and closes by the inner side of the tip of the propodus. The smaller cheliped is similar in form to the larger, but is considerably shorter and very much more slender, and the propodal digit is proportionately longer and its prehensile edge thin and minutely multidentate. Both chelæ are sparsely hairy on the digits and very slightly along the margins of the basal portions. The second pair of legs are very slender and a little longer than the carapax; the merus is about as long as the carpus and chela taken together; the carpus is less than half as long as and slightly narrower than the merus and about three times as long as broad; the chela is slightly longer but scarcely broader than the carpus, and the digits are slender, longitudinal, not gaping, and a little shorter than the basal portion. The third and fourth pairs of legs are very nearly alike, and as long as the second, but more slender; the merus is about as long as the carpus and propodus together; the propodus is about a third longer than the carpus; and the dactylus is slender, nearly straight, and about two-fifths as long as the propodus. The fifth, or posterior, legs are considerably shorter and much more slender than the third and fourth pairs, being nearly cylindrical; the merus is about as long as the propodus; the carpus about three-fifths as long; the dactylus is about half as long as the carpus.

The abdomen is much narrower than the carapax and not expanded in the middle, the sides being nearly straight and parallel. The lamellæ of the uropods are about as long as the telson, the outer as long as broad, the inner a little narrower. The telson is about a third longer than the sixth somite of the abdomen, about two-thirds as broad as long; the lateral edges are nearly parallel and each armed with about four small spines; the posterior margin is regularly arcuate. Near the middle of the dorsal surface there is a transverse line of four small spines, and there are one or two more between these and the tip.

An imperfect *male* specimen, wanting the chelipeds and most of the abdomen, has three spines in front on the dorsal carina, and the spines, of the rostrum slightly longer than in the female.

The single female gives the following:

	mm.
Length from tip of rostrum to tip of telson .....	44.0
Length of carapax to tip of rostrum.....	16.3
Length of rostrum.....	3.1
Height of carapax.....	8.2
Breadth of carapax.....	7.0
Length of right cheliped .....	31.0
Length of left cheliped .....	25.0
Length of right merus.....	8.3
Length of left merus .....	7.0
Length of right propodus.....	12.5

	mm.
Length of left propodus .....	9.0
Breadth of right propodus .....	6.0
Breadth of left propodus .....	3.1
Length of right propodal digit.....	4.5
Length of left propodal digit .....	4.0
Length of right dactylus .....	8.0
Length of left dactylus .....	5.2
Length of telson .....	5.5
Breadth of telson.....	3.8

Stations 873 and 878; 100 and 142 fathoms.

This species is at once distinguished from *A. stirynchus* and *A. serratus* by the narrower and acuminate rostrum, the teeth on the dorsal carina, the form of the chelipeds, and the more slender second, third, and fourth pairs of legs. In *A. stirynchus* and *serratus* the carpus in the second pair of legs is short, expanded distally, and less than half as broad as long, and the chela is nearly or quite half as broad as long.

*Axius serratus* Stimpson (Proc. Boston Soc. Nat. Hist., iv, p. 222, 1852; Smith, Trans. Conn. Acad., v, p. 55, pl. 10, fig. 4, 1879) was dredged the past season from the "Fish Hawk", in 20 fathoms, sandy bottom, in Narragansett Bay; and large specimens, taken on George's Banks, have been presented to the National Museum by Capt. John Q. Getchell and crew of the schooner "Otis P. Lord", of Gloucester, Mass.

These specimens show that Stimpson's species is distinct from the European *stirynchus*. The *serratus* is at once distinguished by its broad and depressed abdomen, which expands laterally in the middle, and is much broader than the carapax. The fourth segment of the peduncle of the antenna and the acicle are both proportionally much longer in *serratus* than in *stirynchus*, being nearly as long as in the species just described. The upper edge of the propodus in both chelipeds is thin and strongly carinated in *serratus*, but thick and rounded in *stirynchus*, and the smaller cheliped is much narrower and has much longer and more slender digits in *serratus* than in *stirynchus*.

**Pontophilus Norvegicus** M. Sars.

Stations 869, 870, 880, 881, 893, 894, 895; 155 to 372 fathoms.

The largest females are 74<sup>mm</sup> long, the largest male 47<sup>mm</sup>. Several of the specimens belong to the variety with the broad and obtuse rostrum described by Sars.

**Pontophilus brevirostris**, sp. nov.

Very closely allied to *P. spinosus* and *P. Norvegicus*, but readily distinguished from both these species by the very short rostrum, which is tridentate, with the median tooth scarcely broader and very little longer than the lateral, about reaching to the cornea of the inner side of the eye and not projecting beyond the line of the spiniform outer angles of the orbits. The proportions of the body are more like *spinosus* than *Norvegicus*, but the carination and armature of the carapax are more

like *Norvegicus*, while the sculpture of the distal somites of the abdomen is more like *spinosus*.

The dorsal carina of the carapax is armed with three spines, and usually a smaller fourth one in front of the others and just back of the base of the rostrum; the subdorsal carina is armed with two spines, as in *Norvegicus*, and often with a rudiment of a third behind these; the lateral carina does not extend back of the middle of the carapax, and is armed with a single spine, as in *Norvegicus*. There are no distinct carinæ on the first four somites of the abdomen, but the fifth somite is flattened above and has subdorsal carinæ slightly diverging posteriorly, and below these, each side, another carina, nearly parallel with the subdorsal; and the sixth somite is flattened above and subdorsally carinated, as in *spinosus*, though the carinæ are not quite as conspicuous on either somite as in that species.

The eyes, antennulæ, and antennæ are very nearly as in *P. spinosus*. The external maxillipeds reach a little beyond the tips of the chelipeds, the penultimate segment reaches nearly to the tip of the antennal scale, and the ultimate segment is a little less than twice as long as the penultimate, while in *P. Norvegicus* it is about once and a half as long, and in *P. spinosus* much more than twice as long, as the the penultimate segment. The thoracic legs differ scarcely at all from those of *P. spinosus*.

The lamellæ of the uropods are very nearly as in *P. spinosus*. The inner lamella reaches nearly or quite to the tip of the telson, is lanceolate, and six or seven times as long as broad; the outer lamella is about a tenth shorter than the inner and about four times as long as broad. The telson is once and a fourth to once and two-fifths as long as the sixth somite of the abdomen, is very narrow, slightly acuminate, and has a very narrow and acutely triangular tip, armed with only two very long, slender, and plumose setæ, which arise near together from the under side.

This species appears to be much smaller than either *Norvegicus* or *spinosus*. The following measurements are from two of the larger specimens:

	♂.	♀.
	mm.	mm.
Length from tip of rostrum to end of telson .....	24.5	36.0
Length of carapax along dorsum .....	6.0	9.5
Length of rostrum in front of the back of the orbit .....	0.7	0.8
Breadth of carapax at anterior margin .....	3.7	5.9
Greatest breadth of carapax .....	3.8	7.1
Length of sixth somite of abdomen .....	3.9	5.3
Breadth of the same in the middle .....	1.1	1.9
Length of telson .....	5.0	7.5
Length of antennal scale .....	3.0	4.4

Stations 865 to 867, 870 to 874, 877, 878; 65 to 155 fathoms. At most of these stations it was taken in great abundance.



*Hippolyte securifrons* Norman.

Stations 897 and 880; 225 and 252 fathoms; three large females.

The branchial formula of this species, written essentially after Huxley's method, is:

Somites.	Podo-branchiæ.	Arthro-branchiæ.	Pleuro-branchiæ.	
VII.....	0 (ep.)	0	0	=0 (ep.)
VIII.....	1 (+ ep.)	0	0	=1 (+ ep.)
IX.....	0 (ep.)	0	0	=0 (ep.)
X.....	0 (ep.)	0	1	=1 (+ ep.)
XI.....	0 (ep.)	0	1	=1 (+ ep.)
XII.....	0 (ep.)	0	1	=1 (+ ep.)
XIII.....	0	0	1	=1
XVI.....	0	0	1	=1
	1+6 ep.	0	5	6 + 6 ep.

*Bythocaris* sp.

Stations 865 to 867, 872, 874, 878; 64 to 142 fathoms.

*Pandalus propinquus* G. O. Sars, Christiania Videnskabs-Selskabs Forhandling, 1869, p. 148 (4); *ibid.*, 1871, p. 259 (16).

Stations 878, 879, 880, 893, 894, 875; 142 to 365 fathoms. The largest specimen is a female, over 110<sup>mm</sup> in length.

This species was dredged in 1879 in the Gulf of Maine, off Cape Cod, station 305, N. lat. 42° 9' 30'', W. long. 69° 41', 118 fathoms, soft mud; and station 343, N. lat. 42° 17', W. long. 69° 51', 116 fathoms, mud. A male, 74<sup>mm</sup> long, from station 305, has the chelate second pair of legs reversed, the short one being on the left and the long one on the right! The legs themselves are of the normal size and structure, and the specimen appears to be perfectly normal in all other respects.

As far as I am aware, the species has heretofore been recorded only from deep water off the coast of Norway.

*Pandalus leptocerus*, sp. nov.

In size and general appearance much like *P. Montagu* (*annulicornis*), but more slender and readily distinguished from it, and from *P. propinquus* and *borealis* as well, by the minutely roughened surface and the presence of exopods upon the external maxillipeds.

The rostrum is from about once and a third to nearly twice as long as the rest of the carapax, and curved very slightly upward, but usually not as much so as in *P. Montagu*. Above, it is armed with eleven to thirteen teeth, of which one is near the tip, as in *P. Montagu*, and usually only two back of the orbit on the carapax proper, while a considerable space back of the terminal spine is unarmed, though this space is usually shorter than in *P. Montagu*. Beneath, there are 6 to 8 teeth, as in *P. Montagu*. The entire surface of the carapax and abdomen is slightly roughened with short and irregular, transverse, punctate ridges, which give rise to very short, bristle-like hairs, while in *P. Montagu*, *propinquus* and *borealis* the surface is naked and very smooth. The

carapax is considerably more slender than in *P. Montagu*, and the posterior tooth of the dorsal carina is farther forward, being much in front of the middle. The abdomen is more slender than in *P. Montagu*; but, except for the greater slenderness, there is scarcely any difference in the form or proportions of the somites, or the form and armature of the telson and uropods. There are slender exopods, about a third as long as the ischia, at the bases of the external maxillipeds, but the endopods themselves are as in *P. Montagu*; the merus reaches to the base of the flagellum of the antenna, and the tip falls considerably short of the tip of the antennal scale.

The first pair of legs are nearly as in *P. Montagu*. The right chelate leg of the second pair is shorter and stouter than in *P. Montagu*, and scarcely reaches the tip of the corresponding leg of the first pair; the ischium is about a fourth the entire length; the merus is only a little shorter than the ischium; the carpus increases in thickness distally, is a little longer than the ischium, not more than about once and a half as long as the merus, and usually composed of only five segments, the proximal half being wholly unsegmented or annulated, then three subequal and very distinct segments, about as broad as long, and these followed by the terminal segment, which is about as long as the three next preceding; the chela is about half as long as the carpus and a little stouter than its distal end.\* The left chelate leg is a little shorter and stouter than in *P. Montagu*, but has about the same number of segments in the merus and carpus, and does not differ in other respects. The third, fourth, and fifth pairs of legs differ from those of *P. Montagu* in being a little more slender and in having much longer, much more slender, and nearly cylindrical dactyli, which are wholly unarmed, except a few small spinules beneath near the base.

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\*The proportions of the segments and the segmentation of the carpus in the unequal second pair of legs in the genus *Pandalus* appear to be usually very constant and to afford very good specific characters, but they occasionally present very remarkable variations. In carefully examining several hundred specimens of this species, only about half a dozen were found which varied from the above description in the segmentation of the left carpus; two or three specimens had an additional but less distinctly indicated segment back of the four distal ones, making six in all. Two specimens had three additional segments inserted in the same way, making eight in all; but in both these specimens the segmentation was more or less irregular, and the additional segments may have resulted from some injury. One large female, quite normal in other respects, has the right carpus multiarticulate throughout and composed of about eighteen segments, nearly as in *P. Montagu*; the whole leg, however, is shorter than in other specimens of the same size, and may have been reproduced, though I cannot see how this would explain its abnormal structure. Detailed measurements of both chelate legs in most of these abnormal specimens are given beyond in the tables of measurements.

One female, 70<sup>mm</sup> long, stations 290 to 291, 30 to 31 fathoms, off Cape Cod, has the chelate legs reversed, just as in the specimen of *P. propinquus* already referred to.

Measurements.

Number.	Station.	Sex.	Length.	Carapax and rostrum.	Length of rostrum.	Breadth of carapax.	Rostrum, formula.
			mm.	mm.	mm.	mm.	
1	373, off Cape Cod, 42 fathoms.....	♂	52	22.0	12.7	5.5	$\frac{3+8+1}{6}$
2	878, off Block Island .....	♂	60	25.4	15.8	6.0	$\frac{2+8+1}{7}$
3	372, off Cape Cod, 70 fathoms.....	♂	75	36.0	23.1	7.3	$\frac{2+9+1}{7}$
4	878, off Block Island .....	♀	61	27.8	17.0	6.5	$\frac{2+8+1}{6}$
5	878, off Block Island .....	♀	65	29.0	17.5	6.2	$\frac{2+10+1}{7}$
6	372, off Cape Cod, 70 fathoms.....	♀	80	35.0	21.3	8.1	$\frac{2+9+1}{7}$
7	878, off Block Island .....	♀	82	38.3	24.8	8.0	$\frac{2+10+1}{8}$
8	878, off Block Island .....	♀	84	39.5	24.5	8.9	$\frac{2+9+1}{6}$
9	372, off Cape Cod, 70 fathoms.....	♀	90	41.1	26.2	8.9	$\frac{2+9+1}{7}$
10	33, off Cape Ann, 90 fathoms .....	♀	90	42.0	26.5	9.5	$\frac{2+10+1}{7}$
11	33, off Cape Ann, 90 fathoms .....	♀	91	42.3	27.2	9.5	$\frac{2+10+1}{7}$
12	33, off Cape Ann, 90 fathoms.....	♀	98	43.5	27.4	10.2	$\frac{2+9+1}{6}$

Detailed measurements of each of the chelate legs, and the number of segments in the carpus, of nine of the above specimens are given below. The first three columns give the number, sex, and length of each specimen, as in the table above; columns four to nine give the entire length of the leg and the lengths of each of the five distal segments; and the last column gives the number of segments in the carpus. For the left carpus this last number is not perfectly definite, as the segmentation becomes irregular and indistinct toward the proximal end.

No.	Sex.	Length.	Right chelate leg.						No. segs. in carp.
			Length.	Ischium.	Merus.	Carpus.	Propodus.	Dactylus.	
		<i>mm.</i>	<i>mm.</i>	<i>mm.</i>	<i>mm.</i>	<i>mm.</i>	<i>mm.</i>	<i>mm.</i>	
1		52	13	3.4	2.7	4.1	2.1	0.9	5
2		60	15	4.0	3.2	4.5	2.6	1.1	5
3		75	22	5.2	4.9	7.0	3.8	1.5	5
6		80	23	5.9	5.1	7.2	4.0	1.6	5
10		90	24	6.6	5.3	7.6	3.9	1.6	5
7		82	20	5.5	4.4	6.5	3.2	1.2	18
4		61	15	4.1	3.2	4.6	2.5	1.0	6
5		65	16	4.0	3.2	5.0	2.5	1.0	8
8		84	22	5.5	1.6	7.0	3.4	1.3	8

  

No.	Sex.	Length.	Left chelate leg.						No. segs. in carp.
			Length.	Ischium.	Merus.	Carpus.	Propodus.	Dactylus.	
		<i>mm.</i>	<i>mm.</i>	<i>mm.</i>	<i>mm.</i>	<i>mm.</i>	<i>mm.</i>	<i>mm.</i>	
1		52	24	5.5	4.5	10.1	1.1	0.6	53
2		60	27	6.5	5.9	12.3	1.2	0.6	53
3		75	35	9.0	8.0	15.0	1.9	0.9	58
6		80	37	9.0	8.5	16.0	2.0	1.0	64
10		90	41	10.3	8.8	18.2	2.0	1.0	64
7		82	39	10.0	8.4	17.6	1.9	0.9	63
4		61	27	6.7	5.7	12.2	1.1	0.6	54
3		65	27	6.6	5.8	12.1	1.2	0.6	52
8		84	39	9.0	8.8	17.5	1.9	0.8	56

Station 870, 155 fathoms (abundant); 873, 100 fathoms; 878, 142 fathoms (very abundant). It was also taken in abundance this season at many stations in shallow water off Rhode Island.

In the dredgings off Cape Cod, in 1879, this species occurred at a great number of the stations, in 15 to 116 fathoms, and was very often associated with *P. Montagu*, and at 116 fathoms with *P. propinquus*. It was particularly abundant in 25 to 50 fathoms, several quarts of specimens often being taken at one haul of the trawl. In the dredgings previous to 1879 it occurred very much less abundantly, and was carelessly confounded with *P. Montagu*, under which name specimens of *P. leptocerus* may have occasionally been distributed in the sets of specimens made up from the Fish Commission collections and distributed from the National Museum. In the dredgings of 1877-78, it occurred sparingly, in 22 to 48 fathoms, in Massachusetts Bay; and in 75 to 90 fathoms, in the Gulf of Maine, off Cape Ann, in considerable abundance and of large size; in both localities associated with *P. Montagu*, and in the Gulf of Maine with *P. borealis* also. In Casco Bay, in 1873, a few specimens only were taken. Among great numbers of specimens of *P. Montagu* from the Bay of Fundy I have not succeeded in finding a single specimen of the new species, although it very likely occurs there. At Halifax, Nova Scotia, a few specimens only, most of them very small, were taken, and these were from 18 fathoms. In the region of George's Banks, in 1872, it was taken in 30, 45, 50, 60, and 430 fathoms,

and appears to have been more common than *P. Montagu*, which occurred with the *leptocerus* in 30 and 45 fathoms, and alone in 28 fathoms.\*

*Pandalus tenuipes*, sp. nov.

This species is smaller but has a proportionally thicker body than *P. Montagu*, and the surface of the carapax and abdomen are very minutely roughened, somewhat as in the last species, but the punctate ridges are much less conspicuous and much more thickly crowded than in that species.

The carapax, including the rostrum, is about two-fifths of the entire length, and the carapax proper is nearly as long as the rostrum, slightly swollen in the middle, somewhat contracted in front, as seen from above, and with the rostral carina extending back to about the middle, and armed, at about a third of the way from the front, with two to four slender teeth, crowded close together and rapidly decreasing in size posteriorly; but between these teeth and the posterior tooth of the rostrum the carina is wholly unarmed. The rostrum is curved upward a little more than in *P. Montagu*, is not expanded below, and is armed the whole length above with eight to ten teeth, which are usually more widely separated distally, though in some specimens the terminal two or three are crowded together near the tip; beneath there are six to ten small teeth.

The eyes are black and as broad as long, but shorter than in *P. Montagu*. The pedicel of the antennula reaches to near the middle of the antennal scale, and the two distal segments are subequal in length and each about as broad as long. The antennular flagella are subequal in length and much longer than the carapax, including the rostrum; the proximal half of the outer flagellum is very much thickened, the terminal portion very slender, as is the inner flagellum throughout. The antennal scale is approximately four-fifths as long as the rostrum, and of very nearly the same form as in *P. Montagu*. The external maxillipeds are very slender, reach to about the tip of the rostrum, and have well-developed exopods, fully half as long as the ischium; the ischium is a little longer than the rest of the endopod, which is composed, as in *P. Montagu*, of only two distinct segments beyond the ischium, and in this case these two segments are subequal in length.

The first pair of legs are very slender and reach to the tips of the external maxillipeds. The second (chelate) legs are exactly alike, and reach to or considerably by the tips of the antennal scales. The ischium is a little longer than the merus; the carpus a little less than twice as long as the merus, slightly shorter than the antennal scale, and composed of about fifteen segments, of which the proximal are separated by

\*In the report on the dredgings in the region of George's Banks (Smith and Harger, Trans. Conn. Acad., iii, pp. 1-57, pls. 1-8, 1874), "*Pandalus annulicornis*" is reported from the following stations: *b*, 30 fathoms; *c*, 28 fathoms; *d*, 50 fathoms; *e*, 60 fathoms; *g*, 430 fathoms; and *q*, 45 fathoms; but on re-examining the specimens I find all those preserved from *b*, *e*, and *g* are *P. leptocerus*, the single specimen from *c* is *P. Montagu*, while from *d* and *q* there are specimens of both species.

indistinct articulations, while the four or five distal ones are separated by conspicuous articulations, of which the ultimate is about twice as long as broad, but the next three or four, each, only about half as long as broad. The chela is slender, only a very little stouter than the distal end of the carpus, nearly a third as long as the carpus, and about half as long as the merus, and the digits are alike, about as long as the basal portion, slightly gaping, and with a very few long, setiform hairs. The third, fourth, and fifth pairs of legs are exceedingly slender, sparsely armed with minute spinules and slender setæ; and the dactyli are very long and slender, slightly and regularly bent, and flattened a little vertically (or in the direction of the plane of the curvature), and wholly unarmed; the fifth pair reach beyond the tip of the rostrum, and the fourth and third pairs are successively a little longer; the dactylus in the fifth pair is a third or a little more than a third as long as the propodus, in the fourth pair a little longer than in the fifth, and in the third pair not far from half as long as the propodus.

The abdomen is evenly rounded and not at all compressed above, and less geniculated at the third segment than in *P. Montagu*. The sixth segment is about once and two-thirds as long as the fifth. The telson is about once and a half as long as the sixth segment, and terminates in an acutely triangular tip, armed each side with two long spines, of which the proximal is very much the longer, and at the extreme tip with a few long, plumose setæ.

*Measurements.*

Number.	Station.	Sex.	Length.	Carapax and rostrum.	Length of rostrum.	Breadth of carapax.	Rostrum, formula.
			mm.	mm.	mm.	mm.	
1	871, off Block Island.....	♂	42	19.2	10.0	5.1	$\frac{4+6}{8}$
2	870, off Block Island.....	♂	50	22.0	11.8	6.2	$\frac{3+7}{9}$
3	878, off Block Island.....	♀	40	16.5	8.3	5.0	$\frac{3+6}{7}$
4	879, off Block Island.....	♀	61	25.0	12.8	8.0	$\frac{2+6}{7}$

Some of the legs of these specimens give the following measurements:

Number.	Leg.	Length.	Ischium.	Merus.	Carpus.	Propodus.	Dactylus.
		mm.	mm.	mm.	mm.	mm.	mm.
1	2d.....	17.0	4.2	3.8	6.3	2.0	1.0
1	2d.....	26.0	3.0	10.0	4.7	5.3	3.0
1	5th.....	24.0	2.0	8.7	5.0	5.5	1.9
2	3d.....	28.0	3.0	11.6	4.6	5.7	2.5
2	4th.....	26.7	2.5	11.0	4.6	5.7	2.3
2	5th.....	25.2	2.5	10.0	5.1	5.0	2.0
3	4th.....	24.3	2.1	9.1	4.6	5.5	2.3
3	5th.....	23.5	2.0	8.2	5.4	5.7	1.5
4	2d.....	25.0	6.5	5.5	9.7	2.7	1.2

Stations 870, 871, 873, 877, 878, 880; 100 to 252 fathoms. Three females from 878, 142 fathoms, were carrying eggs.

The genus *Pandalus*, as at present recognized, apparently contains species representing two or more genera, and the species just described is probably not strictly congeneric with *P. Montagu*, the type species. The equal, chelate legs and the slender, unarmed dactyli of the third, fourth, and fifth pairs of legs separate *P. tenuipes* widely from *Montagu*. The oral appendages afford some characters not indicated in the above description. In *P. tenuipes* the proximal segment of the mandibular palpus is dilated, though not quite as conspicuously as in *P. Montagu*; the posterior lobe of the sephognath of the second maxilla is very short, broad, obtusely rounded at the extremity, and projects very little back of the base of the endognath, while in *P. Montagu* and the allied species it is very much prolonged and acutely triangular posteriorly; in the second maxilliped the dactylus is about as long as broad and articulated with the oblique distal end of the propodus, while in *P. Montagu* and its allies the dactylus is a narrow plate, articulated by one edge to the distal part of the mesial edge of the propodus.

The branchiæ of *P. tenuipes* are the same in number and arranged in the same way as in *P. Montagu* and *P. borealis*; that is, there are twelve branchiæ plus seven epipods on each side; or, stated in full, the branchial formula is:

Somites.	Podo-branchiæ.	Arthro-branchiæ.	Pleuro-branchiæ.	
VII.....	0 (ep.)	0	0	= 0 (ep.)
VIII.....	1 (+ ep.)	0	0	= 1 (+ ep.)
IX.....	0 (ep.)	2	0	= 2 (+ ep.)
X.....	0 (ep.)	1	1	= 2 (+ ep.)
XI.....	0 (ep.)	1	1	= 2 (+ ep.)
XII.....	0 (ep.)	1	1	= 2 (+ ep.)
XIII.....	0 (ep.)	1	1	= 2 (+ ep.)
XIV.....	0	0	1	= 1
	1 + 7 ep.	6	5	= 12 + 7 ep.

*Penæus politus*, sp. nov.

*Male*.—The carapax and abdomen are naked and smooth and the carapax is armed with well-developed antennal, hepatic, and branchiostegial spines, but the sulci are all shallow and indistinct. The rostrum is short, acute, about two-fifths as long as the rest of the carapax, scarcely overreaches the eyes, rises obliquely from the anterior part of the carapax, and then points straight forward; its dorsal crest is armed with seven or eight teeth, of which the posterior one is just back of the orbit, while the two or three most anterior ones near the tip are small or inconspicuous and nearer together than toward the base; the lower edge is ciliated and minutely multidentate, the teeth being slender, acute, and closely crowded, so that, to the naked eye, the edge appears entire. The dorsal crest extends nearly the whole length of the carapax, but gradually fades out posteriorly, and, at about a third of the way from the base of the rostrum to the posterior border, rises into a low and obscure dentiform prominence.

The eyes are very large, obliquely compressed, and black. The peduncles of the antennulæ reach to the tips of the antennal scales; the lamelliform appendages of the basal segments are small, narrow, and do not cover the eyes above, but lie concealed between the eye-stalks; the second segments are slightly longer than the basal, while the third are not quite half as long as the second; the inner flagellum is about as long as the carapax, including the rostrum, and tapers regularly throughout its length; the outer flagellum is slightly shorter than the inner, and suddenly expanded toward the base, but the terminal portion more slender than in the inner flagellum. The antennal scales are about twice as long as the rostrum, rather more than a fourth as wide as long, and taper regularly to the broadly rounded tips. The terminal segment of the peduncle of the antenna is scarcely a fourth as long as the antennal scale, and the flagellum is slender and much longer than the whole body.

The external maxillipeds are slender, and reach a little beyond the middle of the antennal scale, and their exopods to about the middle of the carpi of the endopods. The first pair of legs reach only to the middle of the carpi of the external maxillipeds, the second pair to near the middle of the propodi, and the third and fourth pairs to the tips of the external maxillipeds, and the fifth a little beyond the tips of the fourth pair. The dactyli of the fourth and fifth pairs are slightly compressed, and only about half as long as the propodi.

The first, second, and third abdominal somites are rounded above, but the fourth, fifth, and sixth are compressed and sharply carinated dorsally. The sixth somite is very much compressed, longer than the fourth and fifth taken together, and about twice as long as high. The telson is shorter than the sixth somite, dorsally sulcated with the margins of the sulcus terminating posteriorly in a long spine either side of the tip, which is itself imperfect in the single specimen seen. The outer



lamellæ of the uropods are about as long as the sixth somite, oblong-elliptical, about four times as long as broad, and the terminal spine of the outer margin about a fourth of the way from the tip to the base. The inner lamella is a little shorter, and proportionally very slightly narrower. The bases of the first pair of abdominal legs are connected by a very large and complex sexual appendage, nearly twice as long as the bases themselves.

The only specimen seen is from station 878 (142 fathoms), and gives the following measurements:

Length from tip of rostrum to tip of telson.....	61.0
Length of carapax and rostrum.....	20.0
Length of rostrum.....	5.6
Breadth of carapax.....	6.5
Length of antennal scale.....	11.0
Length of sixth abdominal somite.....	10.6
Length of telson.....	8.2+

*Sergestes arcticus* Krøyer, Oversigt danske Vidensk. Selsk. Forhandl. Kjöbenhavn, 1855, p. (6); Monograph. *Sergestes*, Vidensk. Selsk. Skr., v, naturvidensk. mathem. Afl., iv, pp. 240, 276, pl. 3, figs. 7, pl. 5, figs. 16. 1856.

Stations 880, 881, 891, 893, 894; 252 to 500 fathoms; thirty specimens, most of them in good condition, and several about 60<sup>mm</sup> in length.

*Sergestes*, sp.

Station 893; 372 fathoms; three specimens, over 60<sup>mm</sup> in length. The species is different from any described by Krøyer.

## SCHIZOPODA.

*Thysanopoda Norvegica* Sars.

Stations 879, 880; 225 and 252 fathoms.

*Lophogaster*, sp.

Station 870; 155 fathoms. A species very distinct from *L. typicus* Sars.

*Boreomysis arctica* G. O. Sars, Christianiafjordens Dybvandsfauna, p. 26, 1869 (extr. Nyt Magazin for Naturvidenskberne); Christiania Videnskabs-Selskabs Forhandling, 1871, p. 264 (21).—Metzger, Jahresbericht der Comm. wissensch. Untersuchung der deutschen Meere für 1872, 1873, Nordsee, p. 288, 1875.—*Mysis arctica* Krøyer, Et Bidrag til Kundskab om Krebsdyrfamilien Mysidæ, Naturhistorisk Tidsskrift, III, i, pp. 34, 42, pl. 1, fig. 5, 1861.

Station 891; 500 fathoms.

*Pseudomma roseum* G. O. Sars, Christiania Videnskabs-Selskabs Forhandling, 1869, p. 154 (10); Carcinologiske Bidrag til Norges Fauna, Mysider, part i, p. 54, pl. 4, 1870; Hardangerfjordens Fauna, Christiania Videnskabs-Selskabs Forhandling, 1871, p. 263 (20); Archiv for Mathematik og Naturvidenskab, Kristiania, ii, p. 344, 1877.—Metzger, Jahresbericht der Comm. zur wissensch. Untersuchung der deutschen Meere für 1872, 1873, Nordsee, p. 288, 1875.—Whiteaves, Report on further Deep-Sea Dredging Operations in the Gulf of St. Lawrence [in 1873], p. 16, [1874?].—Smith, Trans. Conn. Acad., v, p. 98, 1879.

Station 891; 500 fathoms.

## CUMACEA.

*Diastylis quadrispinosus* G. O. Sars.

Stations 871, 873, 878; 100 to 142 fathoms.

## STOMATOPODA.

*Lysiosquilla armata*, sp. nov.

This species appears to be closely allied to *L. spinosa* Miers, from the Indian Ocean and New Zealand, or at least more closely than to any of the other species contained in Mr. Miers's recent review of the Squillidæ (Ann. Mag. Nat. Hist., V, v, pp. 1-49, pls. 1-3, 1880).

The carapax is smooth and about once and two-thirds as long as the breadth at the anterior margin, which is about two-thirds of the greatest breadth. The rostral plate is about half as broad as the anterior part of the carapax, very slightly longer than broad, the lateral edges not angulated, but strongly convex in outline, and curved regularly round to the short but sharp and acuminate tip. The four exposed thoracic somites and the first abdominal somite increase rapidly in breadth posteriorly, but from the second to the fifth somite the abdomen is of a nearly uniform width, which is about equal to the length of the carapax. The free thoracic somites, like the anterior abdominal, are smooth and unarmed, except that the first somite projects downward either side in a lamellar, transverse, dentiform process below the posterior margin of the carapax. The five anterior abdominal somites are evenly rounded above and smooth, but the posterior edge of the fourth somite is armed either side for about a fourth of its length from the lateral margin with slender, spiniform teeth, directed backward, and the entire posterior margin of the fifth somite is armed in the same way. The sixth somite is about three times as broad as long, only a little narrower than the fifth; the postero-lateral angle each side is armed with a stout, dentiform spine, back of and within which the dorsal surface is uneven and armed with five to seven spines or tubercles, of which the two or three most posterior are slender spines, but the others more or less tuberculiform and inconspicuous; the middle portion of the dorsal surface is smooth, and the posterior margin, except a short space each side, is armed with slender, spiniform teeth, as in the fifth somite.

The telson is nearly as wide as the sixth abdominal somite and about once and two-thirds as wide as long; the middle portion of the dorsal surface rises in a smooth, oval, longitudinal area, projecting behind above the posterior margin, limited each side by a line of short spinules, and its narrow posterior extremity truncated and three-lobed or obtusely tridentate; each side of this smooth area the surface is armed with many spinules or small tubercles, showing a tendency to arrangement in longitudinal lines; the lateral margins are expanded in front of the large lateral spines of the posterior margin and armed with a few spinules; the posterior margin is armed each side with three spines, of which the

two outer are large, dentiform, and have a spinule between them, while the terminal or inner spines are smaller, slender, and movable, and separated from the large lateral spines by a space armed with three or four spinules, while the margin between the movable spines forms an obtuse, re-entering angle, each side of which is armed with a close-set series of seven to ten slender spinules.

The eyes are large, as broad as the rostral plate, and black. The antennal scale is narrowly elliptical, about three times as long as broad, and the margins ciliated. The prehensile edge of the dactylus of the large "raptorial limbs" (second maxillipeds) is armed with ten slender spines, which decrease in length distally. The bases in each of the three posterior pairs of thoracic legs are armed on the outer side with a conspicuous, acute, and somewhat hooked spine, projecting over the articulation of the next segment. The appendages of the antipenultimate segments of the three posterior pairs of thoracic legs are lamellar and broadly elliptical, though those of the anterior pair are a little shorter and those of the posterior pair slightly narrower than the others. The base of the uropods is armed above with a spinulose crest, running from the base to the articulation of the outer ramus, and at the distal end below with two dentiform spines as long as the inner ramus, below the articulation of which there is another but much smaller spine on the base. The proximal segment of the outer ramus is crested above, the distal part of the outer edge is armed with a crowded series of stout, spiniform setæ, and the lamellar terminal segment is elliptical, nearly as long as the base, and has its edges ciliated. The inner ramus is much longer and narrower than the terminal segment of the outer ramus, which in other respects it resembles.

Measurements.

	♂	♀
	mm.	mm.
Length .....	38.0	47.0
Length of carapax along median line, excluding rostrum .....	7.3	10.0
Breadth of carapax at anterior margin .....	4.2	6.0
Greatest breadth of carapax .....	6.3	9.0
Length of rostral plate .....	2.1	2.6
Breadth of rostral plate .....	2.2	2.8
Greatest breadth of abdomen .....	8.0	10.2
Length of telson .....	3.8	5.0
Breadth of telson .....	6.6	8.5

Station 865, 65 fathoms (one male); 876, 120 fathoms (one somewhat mutilated female, from the stomach of *Lopholatilus*).

AMPHIPODA.

*Stegocephalus ampulla* Bell.

One specimen from station 895; 238 fathoms.

*Epimeria loricata* G. O. Sars, Archiv for Mathem. Naturvidenskab, Kristiania, iv, p. 450, 1879.

Stations 869 to 871, 879, 880, 893 to 895; 115 to 372 fathoms. Abundant at 869, 192 fathoms, and 894, 365 fathoms. Sars's specimens were

from 123 to 262 fathoms, north latitude  $75^{\circ} 30'$  to  $80^{\circ}$ , east longitude  $17^{\circ} 50'$  to  $8^{\circ} 15'$ , west of Spitzbergen.

A few, mostly small, specimens of this species were dredged at different points in the Gulf of Maine, in from 32 to 110 fathoms, 1873, 1874, and 1878, and in 88 fathoms (station 43), off Nova Scotia, in 1877. Mr. Whiteaves dredged it also in the Gulf of Saint Lawrence in 1871, 1872, and 1873. Some of these northern specimens were labeled "*Epimeria cornigera?*" by me, and have been so referred to by Mr. Whiteaves, in his reports on dredging expeditions to the Gulf of Saint Lawrence, in the *Annals and Magazine of Natural History* for November, 1872, and in the *American Journal of Science*, III, vii, 213, 1874; and by Professor Verrill, in the last named serial, vii, p. 407, 411, 1874, and ix, p. 414, 1875.

**Haploops setosa** Boeck, *Christiania Videnskabs-Selskabs Forhandling*, 1870, p. 228 (148); *Scandinav. Arktiske Amphipoder*, p. 541, pl. 30, fig. 7, 1876.—G. O. Sars, *Archiv for Matematik Naturvidenskab*, Kristiania, ii, p. 360, 1877.

Station 880; 252 fathoms; one specimen.

I have examined numerous specimens of this species from different parts of the Gulf of Maine, the Bay of Fundy, off Nova Scotia, and from the Gulf of Saint Lawrence (Whiteaves). In the Bay of Fundy and off Nova Scotia the specimens were dredged in from 20 to 100 fathoms.

**Ptilocheirus pinguis** Stimpson.

Stations 865 to 867, 872; 65 to 86 fathoms.

**Erichthonius difformis** Milne-Edwards.—*Cerapus rubricornis* Stimpson.—Smith, *Trans. Conn. Acad.*, iv, p. 278, 1880.

Station 861; 192 fathoms; three specimens.

**Unciola irrorata** Say.—*Glaucanome leucopis* Krøyer.—Smith, *Trans. Conn. Acad.*, iv, p. 280, 1880.

Stations 865 to 867, 869 to 872, 876, 778; 65 to 192 fathoms.

**Neohela phasma**, sp. nov.—*Neohela*, nom. nov., vice *Hela* Boeck, præoc.

This species is apparently very closely allied to *N. monstrosa* Boeck,\* but has well-developed eyes, and the propodus in the second pair of gnathopods is different in form, besides other slight differences.

*Male*.—The head is about as long as and, including the stout lateral spines, fully as broad as the first somite of the peræon excluding its epimera; the anterior edge is slightly carinated and slightly concave in outline above the bases of the antennulæ, leaving a slightly prominent and obtusely angular rostrum and a fully as prominent and more acute angle either side, just back of which the large and prominently convex eyes, salmon-colored in the recently preserved alcoholic specimen, are situated. The antennulæ are much longer than the rest of the animal;

\* *Forhandl. Scandinav. Naturforskeres Kiøbenhavn*, 1860, p. 669, 1861; *Christiania Videnskabs-Selskabs Forhandling*, 1870, p. 261 (181); *Scandinav. Arktiske Amphipoder*, p. 643, pl. 32, fig. 1, 1876.

the first segment of the peduncle is nearly as long as the width of the head; the second segment is much more slender than the first and more than three times as long; the third segment is more slender than the second and considerably longer than the first; there is a well-developed secondary flagellum, as long as the third segment and composed of about nine slender segments; the primary flagellum is very slender and about one and a half times as long as the peduncle. The third segment of the peduncle of the antenna just reaches the distal end of the first segment of the peduncle of the antennula; there is a small, spiniform tubercle on the outside of the first segment, in line with the lateral spine of the head and the spiniform anterior angles of the first and second epimera. The distal portion of each antenna is wanting in the single specimen examined.

The first gnathopods are of nearly the same form as in *N. monstrosa*, as figured by Boeck, but the inferior edge of the propodus is nearly straight, and the spine at the distal end is directed straight out in line with the edge, and not downward as in the figure of *N. monstrosa*. In the second pair of gnathopods the carpus is about twice as long as broad, and has the unarmed prehensile edge much less oblique than represented in the figure of *N. monstrosa*. The first three pairs of pereopods are very nearly as in *N. monstrosa*; the last two pairs are wanting in the specimen.

The pleon is nearly as high but very much narrower than the last somites of the pereon: the first three somites are subequal in size and very similar in form; the fourth is as long but not quite as high as the third; the fifth is not more than two-thirds as long as the fourth; the sixth is only about half as long as the fifth. The telson is partially consolidated with the sixth somite, and somewhat triangular, with an obtuse tip. The uropods are as in *N. monstrosa*.

*Measurements.*

	mm.
Length from front of head to tip of telson.....	26.0
Length of head and pereon.....	17.8
Length of antennula.....	35.0
Length of first segment of peduncle.....	2.4
Length of second segment.....	8.2
Length of third segment.....	3.2
Length of secondary flagellum.....	3.2
Length of carpus in first gnathopod.....	3.1
Breadth of same.....	1.8
Length of propodus of first gnathopod.....	2.5
Breadth of same.....	2.0
Length of dactylus.....	2.7
Length of carpus of second gnathopod.....	2.7
Breadth of same.....	1.4
Length of propodus of second gnathopod.....	2.5
Breadth of same.....	1.8
Length of dactylus.....	2.0

Station 893; 372 fathoms; one specimen.

*N. monstrosa*, the type of this remarkable genus, and heretofore the only known species, was described from a single specimen, wanting most of the antennulæ and antennæ, dredged in Christiania Fiord, in 20 to 30 fathoms; and G. O. Sars has recently recorded a single mutilated specimen, dredged in 1,215 fathoms, between Norway and Iceland, by the Norwegian expedition of 1876.

#### ISOPODA.\*

**Janira alta** Harger ex Stimpson.

Stations 865 to 867, 892; 65 to 487 fathoms.

**Munnopsis typica** M. Sars.

Station 878; 142 fathoms.

**Cirolana polita** Harger ex Stimpson.

Stations 871, 873, 876; 100 to 120 fathoms.

**Gnathia cerina** Harger ex Stimpson.

Stations 865 to 867, 892; 65 to 487 fathoms.

**Syscenus infelix** Harger, Marine Isopoda of New England, Report United States Fish Commission, vi, for 1878, p. 387, 1880.

Stations 893 to 895; 238 to 372 fathoms.

The following tabular synopsis of the known geographical distribution and the bathymetrical range, as far as ascertained by the investigations on our own coast, gives the principal facts in regard to the distribution of the species, and it will also serve as a condensed list of the species enumerated in the foregoing pages. In the first column the species are checked which are known to occur in the Straits of Florida or anywhere in the Caribbean region; in the second, those known in the shallow waters (under 30 fathoms) of the south coast of New England; in the third, those known from any part of the region from Cape Cod to Labrador; in the fourth, those known to occur in Greenland; in the fifth, those known on the coasts of Northern Europe or in the eastern part of the extreme North Atlantic; and in the sixth, those known from the Mediterranean.

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\* The Isopoda have been placed in Mr. Harger's hands for determination, but he has very kindly identified for me the few species here enumerated, which, however, are only a part of the whole number obtained.

List of the species enumerated in the foregoing paper, with a tabular statement of their geographical and bathymetrical range.

	Straits of Flo- rida, &c.	Southern New England, 1- 30 fathoms.	Northern New England, &c.	Greenland.	Northern Eu- rope, &c.	Mediterranean.	Range in depth.
<b>Brachyura:</b>							
<i>Hyas coarctatus</i> .....		x	x	x	x		0-150
<i>Collodes depressus</i> .....	x						65-142
<i>Euprognatha rastellifera</i> .....	x						65-142
<i>Lambrus Verrillii (nov.)</i> .....							65- 86
<i>Cancer borealis</i> .....		x	x				0-225
<i>Geryon quinque-dens</i> .....			x				100-372
<i>Bathynectes longispina</i> .....			x				85-225
<i>Acanthocarpus Alexandri</i> .....	x						85-155
<i>Ethusa microphthalmia (nov.)</i> .....	x						85
<b>Anomura:</b>							
<i>Homola barbata</i> .....						x	86
<i>Latreillia elegans</i> .....						x	85-86
<i>Lyreidus Bairdii (nov.)</i> .....							100-120
<i>Hemipagurus socialis (nov.)</i> .....							65-155
<i>gracilis (nov.)</i> .....							65-155
<i>Parapagurus pilosimanus</i> .....			x				250-372
<i>Eupagurus bernhardus</i> .....		x	x		x		0-150
<i>Krøyeri</i> .....			x	x	x		8-430
<i>sp. nov.</i> .....							65-252
<i>Munida Caribæa ?</i> .....	x ?						65-142
<b>Macrura:</b>							
<i>Arctus depressus (nov.)</i> .....							86
<i>Nephropsis aculeata (nov.)</i> .....							100-126
<i>Axius armatus (nov.)</i> .....							100-142
<i>Pontophilus Norvegicus</i> .....			x		x		101-372
<i>brevirostris (nov.)</i> .....							65-155
<i>Hippolyte securifrons</i> .....					x		27-252
<i>Bythocaris, sp. nov.</i> .....							65-142
<i>Pandalus propinquus</i> .....			x		x		116-365
<i>leptocerus (nov.)</i> .....		x	x				15-430
<i>tenuipes (nov.)</i> .....							100-252
<i>Penæus politus (nov.)</i> .....							142
<i>Sergestes arcticus</i> .....				x			252-500
<i>sp. nov.</i> .....							372
<b>Schizopoda:</b>							
<i>Thysanopoda Norvegica</i> .....			x	x	x		0-430
<i>Lophogaster, sp. nov.</i> .....							155
<i>Boreomysis arctica</i> .....				x	x		500
<i>Pseudomma roseum</i> .....			x		x		45-500
<b>Cumacea:</b>							
<i>Diastylis quadrispinosa</i> .....		x	x				2-190
<b>Stomatopoda:</b>							
<i>Lyssiosquilla armata (nov.)</i> .....							65-120
<b>Amphipoda:</b>							
<i>Stegocephalus ampulla</i> .....			x	x	x		110-238
<i>Epimeria loricata</i> .....			x		x		32-372
<i>Haploops setosa</i> .....			x		x		20-252
<i>Pulocheirus pinguis</i> .....		x	x				0-150
<i>Erichthonius difformis</i> .....		x	x		x	x ?	0-192
<i>Unciola irrorata</i> .....		x	x	x	x		0-430
<i>Neohela phasma (nov.)</i> .....							372
<b>Isopoda:</b>							
<i>Janira alta</i> .....			x				0-300
<i>Munnopsis typica</i> .....			x	x	x		60-220
<i>Cirolana polita</i> .....			x				0-150
<i>Gnathia cerina</i> .....			x				10-487
<i>Syscenus infelix</i> .....			x				130-372

A numerical summation of the columns of the above table gives the following:

	Whole number of species.	Straits of Florida, &c.	Southern New England, 1-30 fathoms.	Northern New England, &c.	Greenland.	Northern Europe, &c.	Mediterranean.
Brachyura .....	9	4	2	3	1	1	.....
Anomura .....	10	1?	1	3	1	2	2
Macrura .....	13	.....	1	3	1	3	.....
Schizopoda .....	4	.....	.....	2	2	3	.....
Cumacea .....	1	.....	1	1	.....	.....	.....
Stomatopoda .....	1	.....	.....	.....	.....	.....	.....
Amphipoda .....	7	.....	3	6	2	5	1?
Isopoda .....	5	.....	.....	5	1	1	.....
Total .....	50	5	8	23	8	15	3

In addition to the above facts in regard to the distribution of the species, it should be added that two of the species, *Lyreidus Bairdii* and *Nephropsis aculeata*, belong to genera heretofore known only from the Pacific region, and each represented there by a single species only; while a third species, *Lysiosquilla armata*, has its nearest known ally in a species known only from the same region.

Of the fifty species enumerated, fourteen are described as new and three others are indicated as probably new; forty-three are here first recorded as belonging to the New England fauna south of Cape Cod; twenty-eight are new to the whole fauna from Cape Hatteras to Northern Labrador; and twenty-one are new to America, including Greenland. Of the forty-three species new to the Southern New England fauna, fifteen are now known also from the New England fauna north of Cape Cod; and of the remaining twenty-eight, four were already known from the Straits of Florida, three from Greenland and Northern Europe, and two from the Mediterranean.

NEW HAVEN, CONN., November 12, 1880.

**LIST OF THE FISHES OF THE PACIFIC COAST OF THE UNITED STATES, WITH A TABLE SHOWING THE DISTRIBUTION OF THE SPECIES.**

**By DAVID S. JORDAN and CHARLES H. GILBERT.**

The writers have been engaged during most of the present year (1880) in making investigations of the fish and fisheries of the Pacific coast of the United States, in the interest of the United States Fish Commission and the United States Census Bureau. Extensive collections have been made at each of the principal fishing ports from New Westminster to San Diego.

In the present paper a catalogue is given of the species now known to inhabit the Pacific Ocean between the mouth of Fraser's River on the north and San Diego on the south. The names of the species not